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IN NORTH CAROLINA
JANUARY 1977

BIENNIAL REPORT ISSUE
For The Period

July 1, 1974 - June 30, 1976

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Wildlife
IN NORTH CAROLINA

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Banding of waterfowl is but one of the wide range of activities of the Wildlife Resources Commission covered in this Biennial Report issue. Assistant supervising Wildlife Biologist, Charles Woodhouse is shown here affixing a numbered band to the leg of a mallard.

Photo by Luther Partin

State of North Carolina

Wildlife Resources Commission

RALEIGH, N. C. 27611

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His Excellency, The Governor of North Carolina
The Honorable Members of the General Assembly
Raleigh, North Carolina

Dear Sirs:

It is with a great deal of pride and pleasure that we submit to you the Wildlife Resources Commission's 15th Biennial Report for the period of July 1, 1974 to June 30, 1976. This report reflects the accomplishments of the Wildlife Resources Commission and its dedicated staff and employees during these two years. We hope you will share our feeling that these efforts have rendered to the sportsmen of our State better hunting, fishing, growing wildlife populations, and a better informed public in matters of wildlife conservation.

We extend our gratitude to you for your support of this progressive program which has been developed and carried forward for the enrichment of our State and the perpetuation of its valuable wildlife resources.

By working together, we feel confident that we can meet the challenges of the future; we welcome your advice and suggestions toward this end.

Respectfully yours,

Wallace E. Case

Wallace E. Case, Chairman

THE COMMISSION

The North Carolina Wildlife Resources Commission has the dual purpose of serving the interest of sportsmen in the state and also the rich heritage of fish and wildlife. One does not exist without the other.

Without an environment rich in wildlife resources (fish, game and all the rest), there can be no enjoyment of these resources. For example, without deer, there can be no deer hunters. Conversely, without deer hunters, there would undoubtedly be far fewer deer in the State than there are now because sportsmen-supported game management and protection programs have given the State its largest deer population in recorded history.

Balancing the twin goals of the sportsman's interest and the best interest of our resources has been the Wildlife Commission's responsibility for almost 30 years since the Commission was established in 1947 by the North Carolina General Assembly.

"More sport for more people with equal opportunity for all," has become one of the informal mottos of the Wildlife Commission. Another might be "if the best interests of our natural resources are protected, then the best interests of sportsmen and other citizens of the State are also protected."

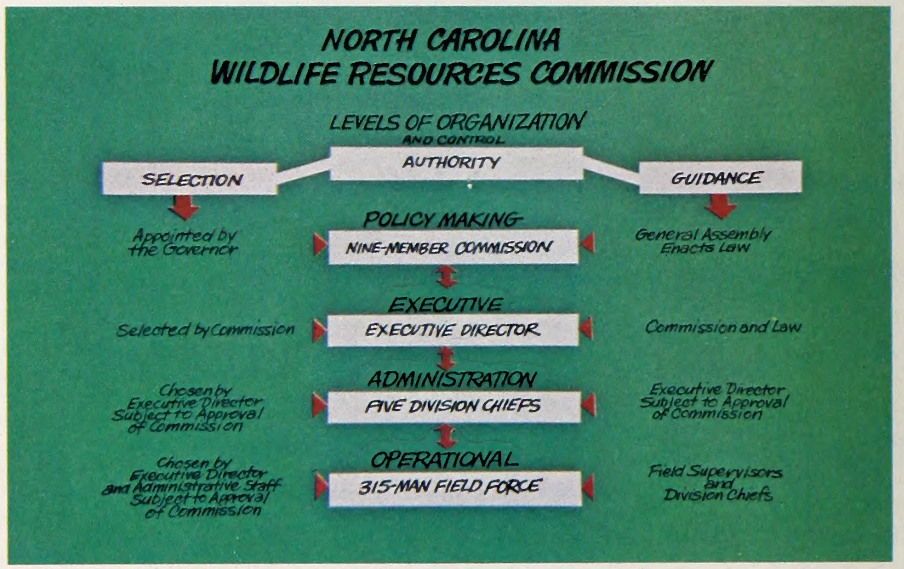
The name Wildlife Resources Commission refers to both the nine-member policy-making board appointed by the Governor, and to the professional agency consisting of the Executive Director, Robert B. Hazel, and the personnel employed by him subject to Commission approval to accomplish the work.

The policy-making Commission is designed to represent the public—to keep a hand on the pulse of the sportsmen across the State. Wildlife Commissioners are interested sportsmen who live in nine separate wildlife districts across the State and therefore maintain contact with local hunters, fishermen and boaters.

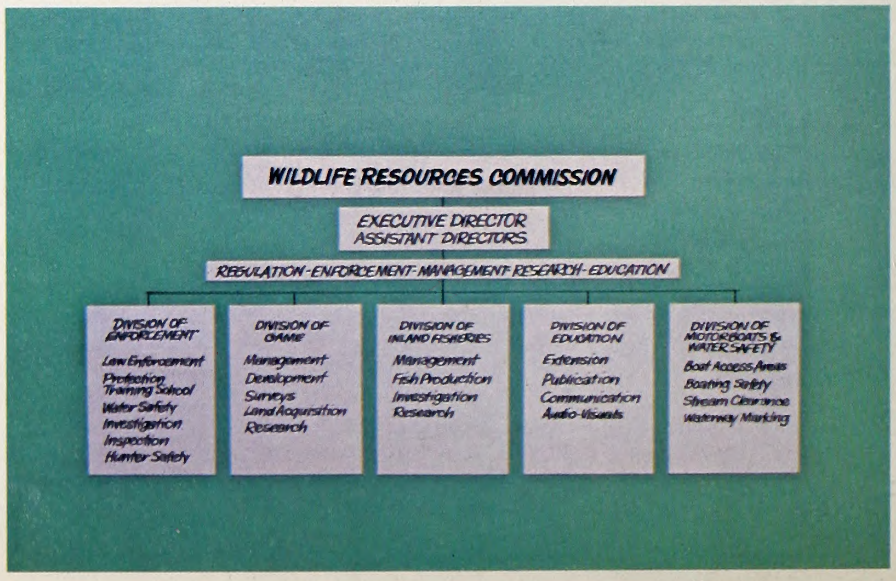
A staff under the executive director provides the professional expertise to accomplish the Wildlife Commission's five-point program which includes REGULATION, ENFORCEMENT, MANAGEMENT, EDUCATION and RESEARCH.

This staff works out of central offices located in the Albemarle Building, 325 N. Salisbury Street, Raleigh, North Carolina. Housed here are the divisions of Enforcement, Inland Fisheries, Game, Education, Motorboats and Water Safety and Interagency Wildlife Coordination. The offices of the Executive Director and Administrative Services are also located in the central offices. Strategically located across the State in the nine wildlife districts are wildlife enforcement officers, fish and game biologists, and technicians.

At regular monthly meetings of the Wildlife Commission the professional staff presents recommendations to the Commission and the five-point program is administered by a blending of the sportsmen's interests and the needs of wildlife resources. Money to support wildlife conservation programs is derived largely from the sale of licenses and from motorboat registration, supplemented each year by Federal Aid funds through an appointment of a share of the excise tax on sporting arms, ammunition, and sport fishing tackle. An additional supplement began in 1959 when one-eighth of one percent of North Carolina's gasoline



The structure, organization and responsibilities of the Wildlife Resources Commission are shown on the charts pictured here. Operational details over the past two years are contained in this report.



fuel tax was appropriated for the purpose of promoting boating safety on the waters of the State. The Wildlife Commission is therefore self-suporting and gets no funds from general taxation.

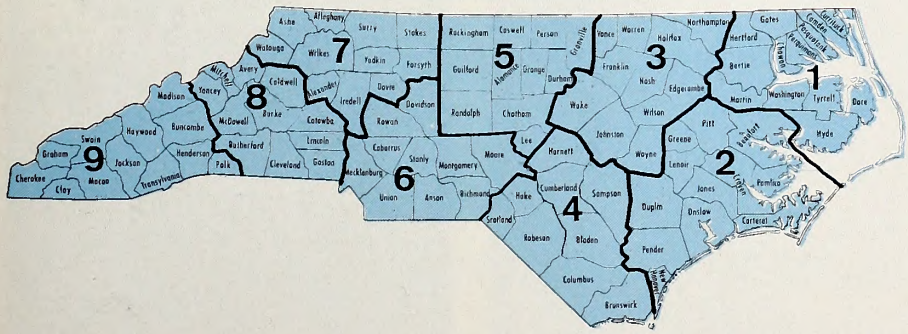
During the 1974-76 biennium, the Wildlife Commission met 18 times for regular monthly meetings and conducted 24 public hearings primarily in the process of adopting hunting and fishing regulations. All Wildlife Commission meetings are open to the public and most are held in Raleigh at the Albemarle Building in the fourth floor conference room.

While the adoption or modification of regulations governing hunting, fishing, trapping or boating comprises a major part of the work of the Commission and staff, many policies relative to other phases of the five-point program are also considered, including enforcement of regulations, education of the public regarding wildlife, hunter and boating safety, management of fish and game and research to determine better methods for managing wildlife habitat and wildlife populations.

A typical meeting might cover the following topics: 1) review of public opinion of proposed changes in fishing regulations gained at public hearings held across the State; 2) the implementation of a new enforcement policy for big game hunting on Game Lands; 3) the approval for construction of a new free boating access area; 4) consideration of new habitat improvement recommendations for a species of fish or game; 5) consideration of a new budget; 6) consideration of a proposal for a new research program to learn more about a species of fish or game; 7) review of a proposal to provide a wildlife conservation teacher's guide for public schools. These and many similar subjects are considered at Wildlife Resources Commission and staff meetings.

Public hearings are conducted, statewide, for the purpose of discussing hunting and fishing regulations prior to their adoption. Suggestions and other input from the public receive careful consideration in the formulation of regulations. The hearings have proven very popular with the public and serve as an important link in the communications system between the Wildlife Commission and the public.

The map below shows the State divided into the nine Wildlife Commission Districts. This geographic division has proven very successful over the years.



ADMINISTRATIVE SERVICES

Without the smooth functioning of Administrative Services, all other activities of the Commission would be impaired and the public image of the wildlife conservation program would quickly deteriorate.

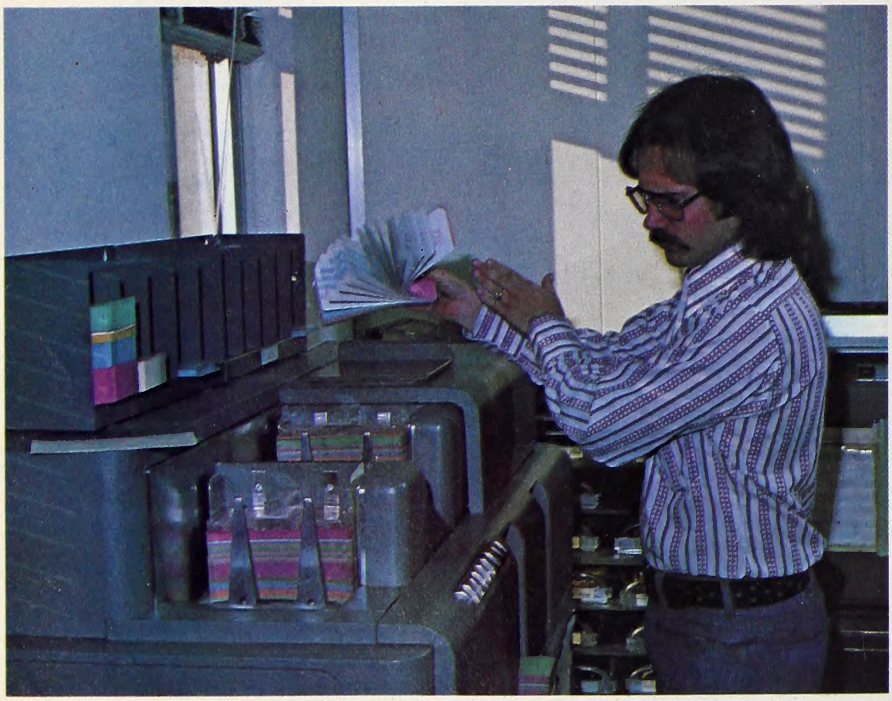
Among the many activities routinely handled are the collection of revenue through the sale of licenses—Commission programs use no general State funds or taxes. The licensing of sportsmen—hunters and fishermen—and certain other activities dealing with wildlife-related operations, registration of motorboats, budgeting, purchasing and the disbursement of funds, accounting and auditing, data processing and all of the housekeeping duties including mail handling, recruitment and coordination of personnel, and operation of warehouse facilities to supply materials and equipment to field stations for field operations are carried on by Administrative Services at the minimal cost compatible with efficiency and good service.

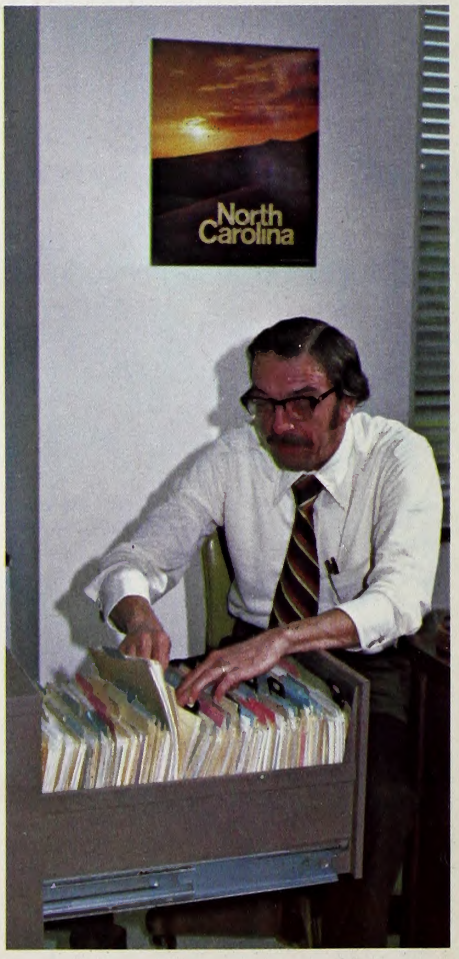
The skilled professional staff engaged in carrying out these activities is composed of dedicated employees working in supportive roles vital to the overall operation of our more visible field activities in the wildlife conservation program.

Federal Aid funds in the amount

Much of the operating budget of the Wildlife Resources Commission comes from the sale of hunting and fishing licenses. Other funds come from motorboat registration, Federal Aid monies, and miscellaneous sources. Data processing (below) continues to be an important support function and greatly facilitates record keeping.

The issuance of thousands of boat registration certificates, hunting and fishing licenses, and various permits, requires up to-date methods and careful attention to detail. Maintaining accurate records is vital to the Wildlife Commission's operations.





of $2,933,520 were apportioned to North Carolina to help finance fish and game development, hunter safety and boating programs. These funds are in the form of a reimbursement for funds spent by the Commission on approved projects. Other income was derived from the sale of timber from Commission owned and managed game lands and other activities such as the sale of the magazine, WILDLIFE IN NORTH CAROLINA, which is published monthly and circulated to about 70,000 subscribers.

An important element in the stability of the Commission's financing is the Wildlife Operating Reserve which provides essential flexibility for planning to meet fluctuations in revenue relating to seasonal income and operating expenses.

Employees turnover during the biennium remained low. As has been often said "Employment in the wildlife field is enviable and personally rewarding." This has been reflected in the quality of individual applicants and their high standards of performance, once employed.

DIVISION OF INLAND FISHERIES

RESEARCH & MANAGEMENT

THE Division of Inland Fisheries' research and management section is responsible for maintaining and enhancing the freshwater fisheries resources in public waters of North Carolina. Fishery biologists and technicians continually strive to accomplish this task by implementing innovative research and management programs which hopefully will solve some of the ever increasing problems associated with the deteriorating environmental quality of existing aquatic habitats and the increased demands by sportsmen to improve the quality of warm and coldwater fishing. Besides working directly with the fishery resource, all personnel within this section are involved in wildlife education and consultation with other state and federal agencies and with private clubs, groups, and individuals regarding proper use of the state's water resources which ultimately determines the status of existing fisheries resources in a given body of water. Presently, this program is being carried out under five major types of activities which are described below:

Technical Guidance

Individuals and public agencies involved in development and land-use planning do not usually have the expertise required to determine effects of certain activities on existing fisheries resources. When plans are developed which could adversely affect the fisheries resources, advice from professional fisheries biologists becomes important to both the preservation of the resource and the fishermen utilizing it. Through this assistance, the State of North Carolina can be reasonably assured that its public waters and fisheries resources will be preserved and/or enhanced for future use.

Advice to landowners on proper management of farm ponds and small lakes results in enhancement of the fisheries resource involved and provides better fishing in local areas. This is beneficial because it improves the overall fisheries resources of the state and tends to take some fishing pressure off of public lakes and streams in local areas.

Upon request, or by statutory authority, division personnel conduct field investigations, review project proposals, prepare reports and presentations and attend coordination meetings with and for private individuals, other governmental agencies, and private industry whose activities may affect the fisheries resources of North Carolina. As a result of these efforts, professional advice and consultation is provided on proper management, conservation and preservation of the fisheries resources in North Carolina to those responsible for, and capable of implementing the recommendations made.

During the period of July 1, 1974 through June 30, 1976, technical advice was given to 494 private landowners and clubs and 447 projects were inspected for possible degradation to the state's fisheries resources. With the projected increases in population and continued demands by sportsmen for improved fishing in the state's public waters, technical guidance activities become more important to the overall program each year and will require an additional number of man-days from field personnel if we are to expect any further improvements in public fishing.

Development

Some of the more important activities accomplished under development are fish stocking, recommending changes in fishing regulations, and writing informational brochures for public distribution. These and several other activities are responsible for the ultimate accomplishment of the Division's major objective — to provide the sportsmen with high quality fishery habitat and optimum exploitation of harvestable-size game fishes.

Stocking of various species of fishes is not always the answer to a particular fishery problem involving population dynamics. However, stocking can be an important fishery management technique when properly used.

During the last biennium, over 2,000,000 fishes were stocked into the public waters of North Carolina and represented 17 species of cold and warm-water fishes. These stockings were made at the request of field biologists in an effort to improve public fishing in selected bodies of water which could benefit from this type of management procedure.

The ability to develop and/or manage a particular fishery depends on the type of regulations which are established for the harvest of individual species. It becomes extremely important for biologists to recommend annual changes on fishing regulations and is one of the most important functions of the division's personnel in assuring that game fish populations are in equilibrium with harvest

Many fish captured alive by various fish sampling methods were marked with a special bright orange, plastic tag, and the fish released after species, weight, etc., had been recorded. Re-capture information is valuable in determining population status.

rates allowed by regulations. Sound regulations are based on biological facts, but social, cultural, political, and economic concerns must also be evaluated before the full impact of any regulation can be determined.

Another important activity which falls under development is the publication and distribution of informational brochures on fishing in selected areas of the state's public waters. Usually these brochures attempt to provide information on underutilized areas in hopes of alleviating some fishing pressure on more popular bodies of water. Each biologist is encouraged to prepare brochures of this type and thereby stimulate an interest in sportsmen who may not have realized the fishing potential of certain bodies of water. Several brochures of this type are now in various stages of preparation for public release.

Fish Kills

The North Carolina Wildlife Resources Commission has the statutory responsibility for determining the magnitude of fish kills occurring within the inland waters of North Carolina. Fish kill assessment is an imporatnt function of our total fisheries management program.

Information obtained from fish kill investigations is used by the State of North Carolina to assess damages and to seek monetary reimbursements from responsible parties.

Personnel of the Division of Inland Fisheries determine the species, numbers, and weights of fishes killed through statistically sound sampling. Monetary values of fishes killed is determined by using the values established by the American Fisheries Society, Southern Division. This information is forwarded to appropriate state agencies charged with the responsibility of determining causative agents in fish kills and also responsible for collecting for damages.

During the last biennium, 275 fish kills, or reported kills, were investigated by field biologists at the total cost of $37,761.81. Total reimbursements for the period (damages assessed against the responsible parties) were $18,028.03 making a net cost to the Division of Inland Fisheries of $19,733.78 for fish kill investigations.

Many fish kills are caused by natural phenomenon or by some type of pollution which cannot be traced to a source. The costs of these investigations are borne by the various state agencies involved in the investigation.

Surveys

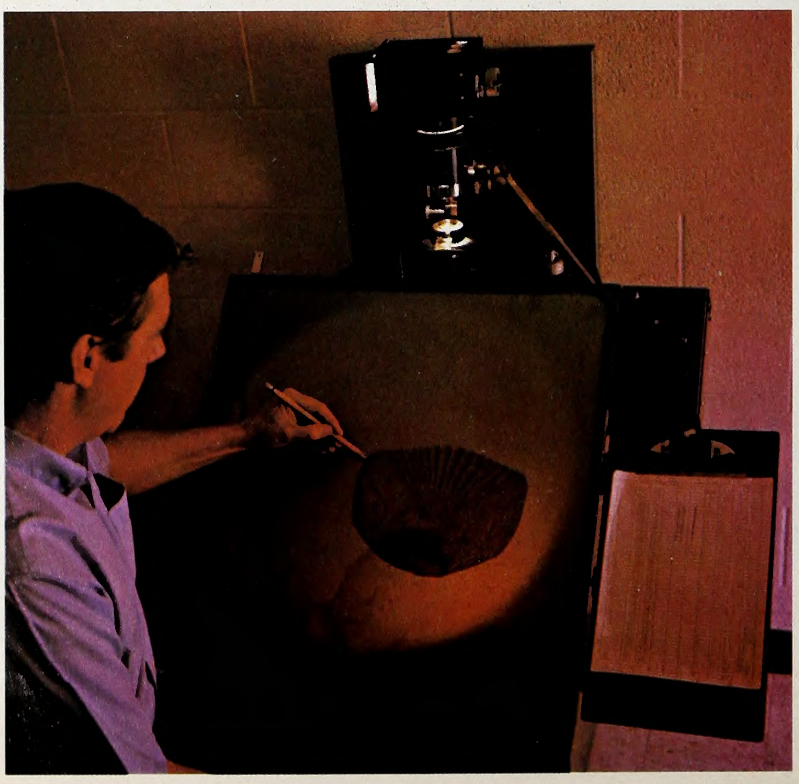
Division biologists periodically review fisheries problems in their work areas and initiate surveys to gather data on selected bodies of water either for a solution to a specific problem or to use as a basis for recommendations on general management procedures. These surveys include routine monitoring of bodies of water to determine the annual composition and condition of fish populations and, when necessary, determine and record physico chemical parameters which may be detrimental to the resource. Surveys are conducted, on selected bodies of water, using routine sampling methods including approved fish toxicants, netting, electrofishing, trawling, trapping, and angling.

Information collected during the survey allows the biologist to determine growth rates of game fishes, general physical conditions, incidence of disease, species composition, reproduction success, and other parameters which are of particular importance to the investigating biologist.

A total of 639 surveys was conducted during the period from July 1, 1974 through June 30, 1976. Management recommendations were made on each body of water surveyed in anticipation of maintaining or enhancing the existing fishery for utilization by the sportsmen of North Carolina.

Florida Bass

A study comparing growth rates of Florida and northern largemouth



Scales are removed from fish captured alive and the fish are returned unharmed to the water. These scales are examined in a special scale projection device and the age of the fish is determined by counting growth rings on the scale. Age and growth data thus derived is important in evaluating the "health" of the fish population.

bass was begun in 1974 at the Fayetteville Fish Hatchery. Both Florida and native bass were produced at the hatchery from wild brood stock collected from natural populations in Florida and in North Carolina. Fishes used for this study were selected from these hatches. Five one-half acre ponds are being used for the experiment, each containing 20 Florida and 20 native largemouth bass. Growth rates are being determined by measuring and weighing each individual twice a year. An angling susceptibility study also is scheduled for July 1977 to determine significant differences between the two species in their response to various angling techniques.

Largemouth Bass Catch Survey

In May 1975, the North Carolina Wildlife Resources Commission decided to ask bass fishermen in the state to help in a survey of largemouth bass populations across the state. Plans call for the study to last five years and its success depends upon the willingness of the state's bass fishermen to supply information.

Anglers, fishing primarily for largemouth bass, were encouraged to participate in the statewide largemouth bass catch survey. The North Carolina B.A.S.S. Federation and the North Carolina Wildlife Federation have asked their membership to take part in the survey. Both organizations have provided the Wildlife Resources Commission with complete club rosters to facilitate contacts.

Every individual or club participating in the survey is asked to maintain a fishing log. Information concerning each fishing trip is recorded in the log. At the end of each month, postcards summarizing the information from the log sheets for each body of water fished are mailed to the North Carolina Wildlife Resources Commission.

Information taken from the summary cards is used to compute catch and harvest rates for the various bodies of water. Catch rates will be considered as indices of the quality of bass fishing in each body of water. Annual comparisons of indices for individual bodies of water will be made to detect trends occurring in the catch and harvest rates. This type of data will provide a basis for evaluating future management strategies designed to improve bass fishing as well as identifying waters where problems may exist.

Electro-fishing has proven to be a valuable fishing sampling method. Special boats (above) have been designed to carry out these operations on selected public waters of the State. Chemical analyses of water (below) continued to be important in the study of fish habitat quality.

Largemouth Bass Life History Studies

In 1975, a study was initiated to obtain information on growth rates and food habits of largemouth bass in the Pasquotank and Chowan Rivers. The Pasquotank River is the principal drainage from the Dismal Swamp. The Chowan River is a major coastal stream of primarily agricultural drainage and has a reputation for excellent largemouth bass fishing. During the spring and fall of 1976, fish population samples were collected by netting, angling, and electrofishing from habitats representative of the smaller upper sections, the middle transition zones, and the broad expenses near the mouth of each stream. Chemical and physical analyses of several water quality parameters also were conducted during each sampling period. Measurements of the total length, weight, and the amount of effort expended to collect largemouth bass were recorded. Scale samples and stomachs were taken from each bass and preserved for analysis of length-weight relationships, age-growth relationships, and food habits. Analysis of these data should yield valuable information on the growth rates and food habits of these fish, and will establish critical parameters for largemouth populations in each type of habitat investigated.

Study to gain life history information on largemouth bass is being conducted on several tributary streams of the Pamlico River. The upper sections of these streams are characterized by black water, low dissolved oxygen content, and abundant marginal cover of wet-

land hardwoods. The lower sections are characterized by relatively clear and brackish water, high dissolved oxygen content and are margined with marshes, upland pines and hardwoods. Excellent largemouth bass populations exist in these areas and fishing success generally is high. The objectives of this study are to evaluate sampling methods and to collect baseline information on the life history of the largemouth bass in the black water and estuarine streams of coastal North Carolina. From this data, a fishery management program will be developed.

Spotted Bass Study

Investigations of upper Coastal Plains streams within the Cape Fear watershed revealed that native game fish populations were sparse. A research study was developed to assess the quality of this underutilized habitat and to evaluate its potential for the introduction of a suitable game fish, such as the spotted bass.

Three streams studied during the past twenty-four months are Lower Little River, Upper Little River, and Rockfish Creek. Various parameters monitored were habitat quality, fish population densities, and quality values.

The spotted bass is essentially a stream fish, similar in appearance to the largemouth and smallmouth bass and has a preference for medium to large rivers. It displays a preference for habitats intermediate to that of the smallmouth and largemouth bass. The basic habitat requirements of spotted bass are streams having gravel or rocky bottoms, marginal turbidity, and fast flowing currents. This species offers excellent management possibilities since it does not compete with either the largemouth bass or smallmouth bass for an ecological niche.

Following field investigations and data collection, a thorough evaluation and comparison will be made between the existing habitat characteristics and those documented for this species. A decision then will be made regarding the potential this species offers in establishing a new fishery in these underutilized fishery habitats.

Hybrid Sunfish

Small lakes and ponds provide thousands of hours of sport fishing for sunfishes, such as bluegill, redear sunfish (shellcracker), and redbreast sunfish (robin). Unfortunately, these species often overpopulate their environment, resulting in slower fish growth and a small or average size. This characteristic may greatly reduce the quality of the sport fishery in the affected waters.

In 1973, a study was initiated to determine the feasibility of utilizing hybrid sunfish as a replacement for the sunfish species common to lakes and ponds. The hybrid selected for study was the progeny of the male redear sunfish and female green sunfish. Hybrids were produced at the Fayetteville State Fish Hatchery and stocked as fingerlings that fall into several selected ponds. Since that time, their survival, growth rates, catchability, and reproductive success have been monitored.

Data collection continues but to date, no definite conclusions have been drawn concerning the future role of hybrid sunfish in North Carolina's fishery management programs.

Striped Bass

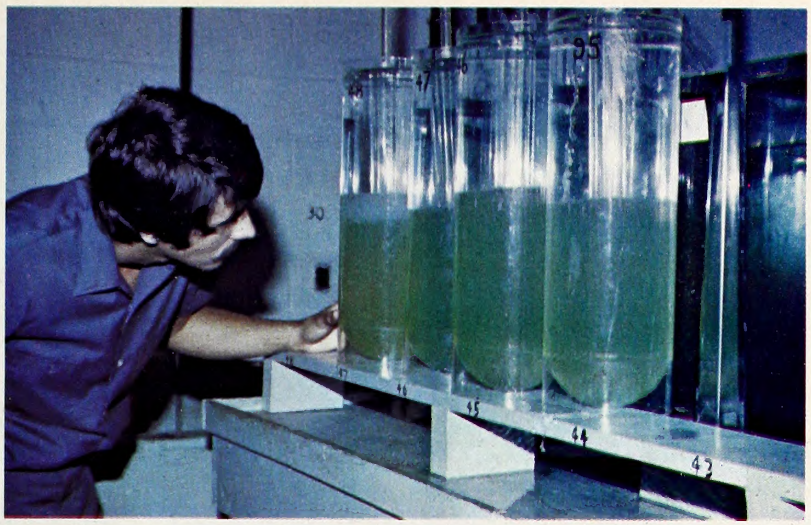
Fishing for striped bass in our inland reservoirs continues to im-

Old automobile tires continued to provide the raw materials for fish shelters in areas where natural structures do not exist. These sites were marked (below) so that fishermen could benefit from the expected fish concentrations.

prove and is destined to get even better in the future. The current program of stocking striped bass fingerlings is responsible for developing a fishery in many of the large Piedmont reservoirs. Nearly a million fingerlings have been released in the reservoirs of the state during the past biennium and fishermen can anticipate harvesting many of these in the future.

In order to successfully establish a striped bass fishery, it is necessary to rear and stock fingerling-size (about two inches) fish. Consequently, the striped bass program in North Carolina has been reshaped to produce more of these fingerlings. A major limiting factor has been the lack of warmwater hatchery facilities in our production section. The dramatic increase in the numbers of fingerlings stocked during this biennium was made possible by providing the excess fry produced each spring at the Weldon hatchery to federal hatcheries and to wildlife agencies of other states. In exchange, these agencies have returned to North Carolina 25 percent of all the fingerlings produced from the Weldon fry.

North Carolina is blessed with an ample amount of public water capable of sustaining high quality striped bass fisheriees on a put-grow-and-take basis. Work already completed will ensure North Carolina fishermen of improved striper fishing throughout the next five years. Long term improvements in the program will be dependent upon how well the needs of future fingerling production are met.



The striped bass hatchery at Weldon, continued to produce fry for stocking and rearing for experimental uses. The hatchery is operated only during the striped bass spawning season, April and May.

Small Lake and Pond Management

Municipal water supply and recreational lakes can provide the angler with a high-quality fishery resource that frequently is very close to home. Located near cities, these waters are easily utilized and in many instances receive heavy fishing pressure. Because of their relatively small size, they can be managed with a reasonable degree of efficiency. Many municipalities have entered into contracts with the Wildlife Resources Commission in order to provide and maintain good management programs for these lakes. The Division of Inland Fisheries provides fisheries biologists to conduct surveys, evaluate the fish populations, and offer management recommendations. In turn, the city or county agrees to abide by the recommendations made by the biologists to improve the fishery. In many cases, as part of the agreement, lake wardens collect catch data thereby providing biologists with extremely valuable information on the quality of the fishery. Management recommendations made after analyses of this and other data could include fish stocking, installation of fish attractors, improvement of public access, special creel regulations, and fertilization programs.

In conjunction with management programs, these lakes frequently are used for special projects involving the evaluation of sampling and management techniques. For instance, work presently is being done with largemouth bass populations to provide information on the size of bass populations and the proportion harvested by fishermen.

Farm ponds make up an immense and underutilized fishery resource. Over 66,000 have been built in North Carolina with the assistance of the Soil Conservation Service and countless others have been constructed without technical guidance. Since small ponds are relatively easy to manage and very productive, they could be one of the major fishery resources of the state.

In an effort to improve management of this vast amount of fishing water, the Division of Inland Fisheries offers pond management advice to private pond owners upon request (fish for stocking private ponds are not provided). Ponds are visited by biologists as their schedules permit, and owners are given specific recommendatons on how to improve their ponds. The most common problems found in these ponds is fish population imbalance caused by overpopulation of sunfish or the stocking of species that are not well suited for small ponds such as crappie, redbreast sunfish, shiners, and bullheads. Advice also is frequently given on problem vegetation control and fertilization.

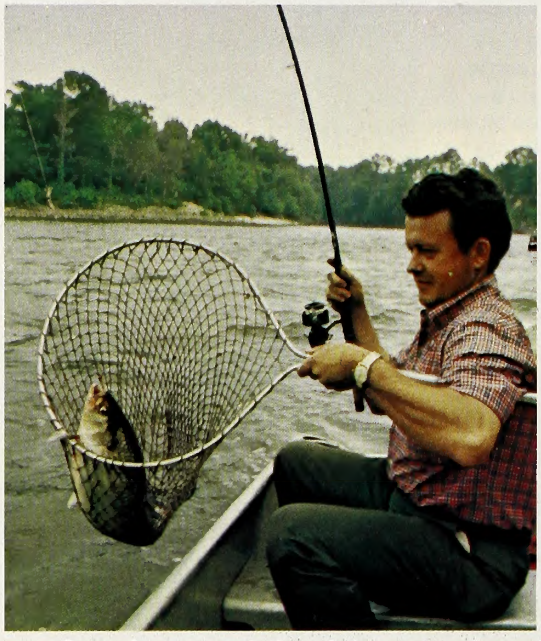
Trout

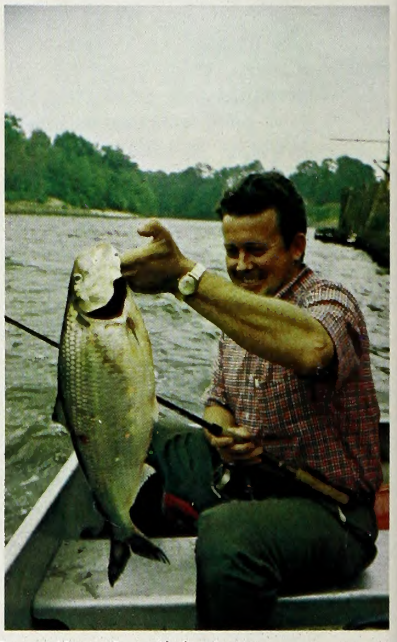
Perhaps the main long range problem facing trout streams is ever increasing fishing pressure and its effects on wild trout. New roads have opened up hitherto inaccessible areas to the average fisherman. This fact, plus a growing population with more and more leisure time, have resulted in heavy pressure on a limited resource—pressure that undoubtedly will increase as time goes on.

Lack of a trout management policy that the general public can understand is a factor affecting

Trout stream management included sampling fish populations using portable electric shockers. Fish are stunned and can be scooped up in dip nets, measured, weighed and released in a few minutes, unharmed.

management of our western trout streams. The average fisherman has no idea why we apply "General" regulations to one stream and "Native" to another. He has no idea why we stock one stream lightly and another heavily. Naturally, as long as he does not understand why we do certain things, it is difficult to expect him to go along with any change in the status quo. In an effort to combat this, the Fish Division is now in the process of drawing up a trout management policy and classification system. Once this process is completed and approved by the Commission, we will make every effort through magazine articles, news releases, etc., to make sure the average fisherman understands it. The proposed classification of trout streams, depending on which form it takes, could take several years to complete, and we plan to begin surveys within the next biennium. We know very little about many streams, particularly the smaller ones, and on-site surveys using electrofishing, hiking, interviews with enforcement officers and local residents, etc., will be necessary in order for us to determine the best possible management program for a particular stream.





Spawning runs of the white or American shad continued satisfactory during the biennium, with previous investigations and management including operation of river locks during peak migrations, paying off in good sport catches.

FISH PRODUCTION

THE Fish Production Section is responsible for the operation of the North Carolina Wildlife Resources Commission's six full-time hatcheries plus its seasonally-operated striped bass hatchery. Four of the hatcheries, Armstrong, Marion, Roaring Gap, and Waynesville, concentrate entirely on rearing coldwater fishes. Fish culture at Table Rock Hatchery is oriented toward research and production of coolwater fishes, while Fayetteville Hatchery is maintained entirely as a warmwater research and rearing facility. Weldon Hatchery is operated during April and May for the purpose of procuring eggs from striped bass while on their annual spawning run up the Roanoke River.

The main thrust of the four coldwater hatcheries is the production of stocking-size mountain trout—brook, brown, and rainbow trout—for introduction into Designated Public Mountain Trout Waters having a "General Trout Waters" classification. Additional functions include rearing fingerling trout to supplement natural reproduction in "Native" and "Trophy" trout waters when needed; developing disease resistant brood fish; hybridizing wild and "domesticated" mountain trout in an effort to produce progeny with a greater inherent instinct for survival in the wild; and, rearing steelhead trout to the "smolt" size for establishing lake populations that will attain trophy size and then ascend tributary streams for spawning.

Fish culture at Table Rock Hat-

chery is focused on the production of muskellunge, tiger muskellunge (northern pike x muskellunge hybrid), and walleye, however smallmouth bass and striped bass fingerlings also are reared. In addition to these species, thousands of forage fishes must be reared as food. Brown trout also are reared and held in the flume line during the colder winter months.

Fayetteville Hatchery has been turned into a research station exclusively, with some of the experimental fishes being reared for stocking into North Carolina's public waters. Striped bass are "double cropped" at this station with the first crop of fingerlings being reared from fry from South Carolina, and the second crop being reared from fry from our Weldon Hatchery. Roanoke bass and hybrid sunfish (green sunfish x redear sunfish hybrid) also are reared for experimental introductions. Studies of various comparative aspects between the northern largemouth bass and the Florida largemouth bass were continued throughout the biennium.

Many of the excessive-chlorine related problems with the Weldon Hatchery water supply that beset this facility during recent years were corrected during the biennium with the installation of a sodium thiosulfate drip station. Losses due to chlorine, particularly in 1976, were negligible.

Fishes stocked into the public waters of North Carolina during the July 1, 1974 - June 30, 1976 biennium have been summarized as follows:

TROUT
1975 - 1976

STATE PRODUCTION

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	78,443	29,211	92,264	1,475	1,142	2,067
Brown Trout	73,500	19,975	167,446	1,002	1,825	2,368
Rainbow Trout	179,407	48,719	208,042	692	1,674	1,762
Steelhead Trout	800	119	4,822	1,033		
TOTALS:	332,150	98,024	472,574	4,202	4,641	6,197

FEDERAL PRODUCTION

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	53,000	16,233				
Brown Trout	82,542	17,626				
Rainbow Trout	126,792	32,853				
TOTALS:	262,334	66,712				

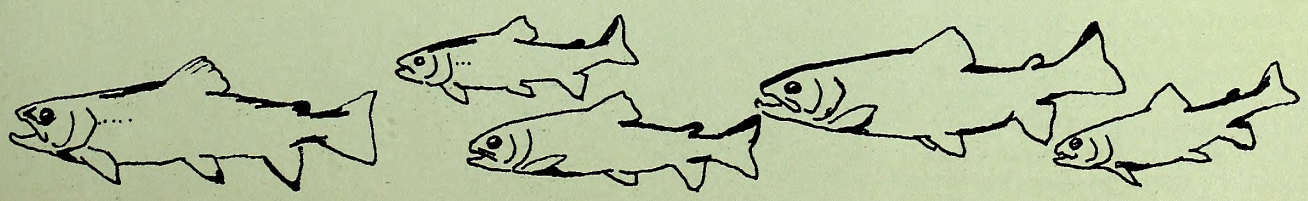
TROUT
1974 - 1975

STATE PRODUCTION

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	77,500	23,986	192,860	8,851	628	1,378
Brown Trout	92,353	24,977	153,700	369	44	131
Rainbow Trout	192,067	45,758	177,893	9,403	6,100	5,641
Steelhead Trout						
TOTALS:	361,920	94,703	524,453	18,623	6,772	7,150

FEDERAL PRODUCTION

Species	Yearlings	Pounds	Fingerlings	Pounds	Brood Fish	Pounds
Brook Trout	68,375	17,283				
Brown Trout	82,300	14,667				
Rainbow Trout	185,402	46,859				
TOTALS:	336,007	78,809				



FISH STOCKING 1974-76 Continued

WARMWATER FISHES

Species	1974-1975 No. Stocked	1975-1976 No. Stocked
Largemouth Bass	27,525	18,492
Smallmouth Bass	22,900	20,000
Redbreast Sunfish	17,447	17,750
Bluegill	49,500	1,395
Redear Sunfish	20,147	
Roanoke Bass	1,307	8,340
Bullheads		6
Flathead Catfish		60
Channel Catfish	136	93,231
Hybrid Sunfish	19,729	1,112
TOTALS:	158,691	160,386

RELOCATIONS

Species	1974-1975 No. Stocked	1975-1976 No. Stocked
Threadfin Shad	28,425	39,701
Blueback Herring	913	4,693
TOTALS:	29,338	44,394

COOLWATER FISHES

Species	1974-1975 No. Stocked	1975-1976 No. Stocked
Muskellunge	1,656	999
Tiger Muskellunge	220	7,127
Walleye	4,350	15,506
TOTALS:	6,226	23,632

ANADROMOUS SPECIES

Species	1974-1975 No. Stocked	1975-1976 No. Stocked
Striped Bass		
Eggs		12,335,000
Fry		5,760,000
Fingerlings	426,786	581,695
TOTALS:	426,786	18,676,695

DIVISION OF ENFORCEMENT

DURING this period, the Division's title changed from Division of Protection to the Division of Enforcement. Effort by the Division was directed toward the Commission's long-standing policy of fair and impartial enforcement of all laws within its jurisdiction. Special emphasis was placed on convert operations and on night deer hunting. During this span approximately 100 persons were arrested for commercialization of fish and game and 748 for night deer hunting.

Personnel

Some major changes were approved. The Division now consists of 88 Wildlife Enforcement Officer I's, 53 Wildlife Enforcement Officer II's, 36 Wildlife Enforcement Officer III's, 9 Wildlife Enforcement Assistant Supervisors, 9 Wildlife Enforcement Supervisors, 3 Patrol Pilots, 3 Wildlife Hunter Safety Enforcement Officers, 2 Assistant Chiefs, 2 Secretaries and the Chief. The North Carolina General Assembly approved 15 new Wildlife Enforcement Officer positions—these officers being placed in the nine districts in areas demanding more law enforcement. Wildlife Enforcement Supervisor L. C. Spain passed away and was replaced by Allen Ray Elks.

Several additional specialized courses were added to the intensive training program for enforcement officers. The training opportunities offered through the cooperation of the Institute of Government at Chapel Hill, include practical field investigation (below) such as crime detection methods.

Tom Rollins retired and Sterling Baker replaced him as Wildlife Enforcement Supervisor.

Training

To keep up with the need for specialized and improved training, additional courses were introduced into our training program. Such courses as High Speed Pursuit Driving, Identification of Dangerous Drugs, Dealing with the Mentally and Emotionally Disturbed, Basic Field Interviewing and Custodial Interrogation, and Trapping promotes a higher degree of proficiency and safety. These additional courses will require that the Basic Training School be lengthened to ten weeks, making a total of 13 weeks of formal training for all officers within the first year of employment. As a result of the many hours devoted to training, twelve officers of this Division have been awarded the Advanced Law Enforcement Certificate by the North Carolina Criminal Justice Training and Standards Council.

Equipment

All patrol vehicles and 115 patrol boats were equipped with electronic sirens. A study of a new radio system was formulated. We made a study of boats and motors needed for certain areas and started purchasing on a more specialized basis.

Field Operations

The following tabulation of data will show the magnitude of the Division enforcement activities during the biennium:

Biennium 1974-76		
Number hunters and fishermen checked	660,406	
Number of violations	23,200	
Violation rate		3.5%
Number of convictions	21,925	
Conviction rate		94.5%
Number of boats inspected	153,222	
Number of violations	5,505	
Violation rate		3.6%
Number of convictions	5,023	
Conviction rate		91.2%

Firearm and Hunter Safety Education

The North Carolina Firearm and Hunter Safety Education Program improves each year but we feel exceptionally proud that during this period we accomplished several ma-

Efficient law enforcement requires modern communications equipment and training in its use. Field radios are constantly upgraded. Patrolling of the public waters is a responsibility of enforcement officers (below), and studies are underway to select boats and motors for specialized needs.

Over 66,000 hunters and fishermen were checked during the biennium and this activity remained one of the primary responsibilities of the enforcement officers.

During the biennium, almost 60,000 individuals received hunter safety instruction and 773 instructors were certified. North Carolina's program was recognized by the National Rifle Association as one of the ten best in the country. Aircraft (above) continued to play an important part in the efficient enforcement of wildlife laws.

jor projects that made our program even better. In the biennium just closed we trained 56,976 students and certified 773 instructors which brought us to 89,000 students trained since the program began. Our program again received recognition from the National Rifle Association of America as being in the top ten in the United States and Canada. New, completely parallel, Instructor and Student Manuals were developed. These new manuals were written to appeal to a more perceptive group, but still in reach of other students. A computerized system of maintaining records of certification was developed.

The purpose of the program remained the same: to enhance the safety and well-being of firearms users and all citizens in the safe use of firearms, including home safety and the avoidance of accidents and hazards associated with hunting. This was accomplished by providing additional instruction on related matters including survival techniques, first aid, sporting ethics, principles of wildlife management and the proper use of archery equipment. To indicate a broader view, the name of the program was changed from "Hunter Safety" to "Firearm and Hunter Safety Education." The objective was to provide a comprehensive firearm, archery and hunter safety education program, encouraging safe firearm and bow and arrow handling, sportsmanship and environmental conservation to all citizens of our state.

Our program was not only offered to clubs, colleges, public and private schools and universities, but our officers worked with the handicapped—the deaf and totally blind, teaching the feel of the different parts of the weapons.

Information compiled from the Uniform Hunter Safety Casualty Report indicated the problem resulting in accidents in the field, as in the past, was mistaken identity, followed closely by the shooter not knowing the position of the safety on the weapon involved—this showed in 13 self-inflicted wounds.

The minimum classroom time required for this course was six hours, with some schools having as much as 24 hours. Three hours of this time was spent on guns and gun handling, fundamentals of shooting, cleaning, transporting and storage. The remaining time was divided among vision, game identification, archery, hunter-landowner relationship, hunter ethics, game laws, game management, first aid and survival. This allowed about 26 minutes each for these topics.

DIVISION OF GAME

RECENT shortages of some basic raw materials have, once again, reminded us that our natural resources are not to be wasted. Conservation measures must be taken to ensure the well-being of those resources which we now enjoy and often take for granted. The need for careful planning certainly applies to the conservation of wildlife resources also. Increased demand for hunting opportunity and renewed interest in other wildlife recreational opportunities require that the Division of Game continue to find ways to ensure adequate populations of wildlife species through intensive management activities. This job is becoming more difficult as key habitat is lost through general urbanization.

Activities of the Division are divided into several categories designed to accomplish the assigned task of managing North Carolina's wildlife populations and habitat. Activities include the collection of basic research and survey information to provide an indication of the status of wildlife populations. This information is utilized in recommending sound regulations for the harvest of game species. This information is also utilized in the formulation of habitat management plans. Habitat management is another major category of work activity carried out statewide by Division personnel. Intensive efforts are made to provide quality hunting on public Game Lands through specialized habitat improvement techniques. Technical guidance is another category and is offered as an extension activity for the benefit

A variety of services and assistance were offered to landowners and sportsmen in the development of upland game habitat on private lands. Much of the small game hunting is done on the State's private lands.

At top, ground is prepared prior to flooding a diked waterfowl habitat improvement area. Impoundments of this type are popular with hunters.
Lower, heavy equipment prepares a site prior to planting of tree seedlings.

of individuals and organizations requesting assistance on wildlife related needs. Landowners who wish to manage their lands for increased wildlife benefits are especially encouraged to utilize this available service.

Game Lands Management

Approximately two million acres of land are open to public hunting under the Wildlife Commission's game lands program. Game lands are located in all sections of the state and provide a cross-section of all types of hunting available in North Carolina. In addition to hunting license requirements, users of the game lands must have a $8.00 game lands use permit which is valid on any game land throughout the entire season. One-half of the revenue received from these permits is paid to the landowners, the other half is used by the Commission for protection and development for improved hunting and fishing. The Commission also posts the boundaries for field identification and prepares maps to aid hunters in locating the game lands.

Game lands are classified into three different types, based on species available and hunting time. "Doves only" areas are portions of actively operating farms that are managed for dove hunting and open to hunting three days per week (Monday, Wednesday and Saturday) for doves only, during the dove season. The three-day limitation is required for two reasons: (1) to hold interference with farming operations to a minimum, and (2) to keep from "burning out" the dove fields by overshooting.

"Any game" three-day per-week areas are also located mostly on actively operating farms, but two Commission-owned tracts — Sandhills and Caswell — are also in this group. Several of these areas have been developed for dove hunting, and the Sandhills Game Land has annually hosted hundreds of hunters who have taken over 10,000 doves in some years.

The remaining game lands, which comprise the bulk of the nearly 2,000,000 acres are open six days per week. All species of game may be hunted during appropriate seasons, with minor exceptions as stipulated in the regulations.

Over 161,700 hunters bought permits to hunt and fish on game lands during the biennium.

Wildlife Services

During the biennium the administration of some aspects of the upland game program on private lands was changed to ensure more efficient program operations and to meet certain new Federal Aid requirements. The objectives of the overall upland game program, however, have not been changed. The Wildlife Commission has recognized that the annual crop of game is largely produced and hunted on

private property. In order to produce quality hunting opportunities for the public on these lands, landowners and sportsmen can request and receive a variety of assistance in habitat improvement practices.

Several categories of assistance are available to the public. Advice to landowners on wildlife habitat improvement possibilities and the review of plans for development projects of questionable impact on wildlife are the two major categories. During the two-year period 1,047.45 man-days of effort were expended on technical guidance requests from the public. A staff of nine district wildlife biologists provided this guidance.

The main goal of the upland game program is to produce and maintain good wildlife populations. One means of increasing game availability and numbers where resident populations are low is through habitat improvement practices. Game food and cover planting materials were produced and distributed free-of-charge to 10,687 cooperating landowners and sportsmen as follows: 1,409,000 shrub lespedeza seedlings; 17,427 two-and-one-half-pound planting units of a perennial seed mixture; 65,440 five-pound units of annual seed mixture; 746 two-and-one-half pound planting units of reseeding annual seed mixture and 4,728 two-pound units of sericea lespedeza. Other types of wildlife food producing plants such as sawtooth oak, and autumn olive were available upon request.

In the heavily populated areas of the state, public access to privately owned land is limited. For this reason the Commission has made provisions to provide hunting opportunity for the urban hunter. Special "dove" and "all species" hunting areas totaling around 15,000 acres were leased near population centers around the state. Approximately 200 acres were planted in dove attractants on the farms designated for dove hunting only. Game food and cover plots were established on those farms where all species hunting was in effect.

Reports from the wildlife biologists in charge of these areas indicate that use levels continue to increase. It is becoming apparent that more acres of quality hunting land near the urban center of our state is a real need.

Other service oriented programs of the Division included supervision of 40 licensed controlled shooting preserves, administration of the application procedure for permits to sell pen-raised game birds for food purposes and a program to provide artificial nest boxes for squirrels and wood ducks. A total of 394 squirrel nest boxes and 158 wood duck nest boxes were constructed and erected by cooperating individuals and groups. Wildlife biologists inspected these boxes for proper construction and correct placement in suitable habitat areas.

Above, seeds are loaded into an aircraft modified for aerial seeding. This new technique was tried for the seeding of permanent food plots to improve small game habitat. Seed distribution is shown at left, below. A six-year study was developed to determine the status of the raccoon in western North Carolina. One of the live traps being used in the study is shown below.

The cooperative raccoon relocation project continued during the current reporting period. The major objective of the program is to take raccoons in the east, where abundant populations exist, and restock these animals in western counties where populations of raccoon are low. Organized sportsman groups assisted in this effort. During fiscal year 1974-75, 214 raccoons were relocated; 187 were relocated in 1975-76.

A cannon net is used for live trapping deer. They were relocated on unoccupied range in western North Carolina. Above, tree seedlings are planted on a cut-over site on the Sandhills Game Lands.

Wildlife Investigations

Research and surveys are two categories of investigations through which information on the status of wildlife populations is obtained. The Federal Aid in Wildlife Restoration Act, P.L. 75-415, provides a major share of the funding for these investigations. The purpose of this act is to give each state an increased research capability to determine needed information for setting proper harvests, finding improved management techniques and learning new facts on the biology of game species. The Division conducted a number of studies during the biennium ranging from a comprehensive radio-telemetry study on black bear to waterfowl banding on a statewide basis. Ten major "studies" were conducted during the period. Information relating to several of these studies, which generally are of special interest to our readers, is presented under this section.

A project to determine the wood duck population continues. Here, a banded wood duck is being released from a "swim-in" trap. The return of this recorded band will help evaluate duck movement and population density.

During the last biennium, 136 wild ring-necked pheasants were live-trapped on the Outer Banks and relocated on the Pungo National Wildlife Refuge in Washington and Hyde counties. Surveys during the period indicate that these birds may be having difficulty on these inland sites. In 1975-76, 29 birds were observed on these areas and no brood sightings were made.

Waterfowl banding was a major activity during this segment. The purpose of banding is to determine waterfowl survival and movement patterns in order to gain needed management information. This information is also necessary in developing a framework for establishing waterfowl regulations. Division personnel banded 1,650 waterfowl during the 1974-75 banding period and 2,968 during the 1975-76 period.

Another survey activity which reveals waterfowl and other hunter use patterns and also provides a variety of needed information for the Division is the annual Hunter Mail Survey. This survey revealed that the wood duck remains the leading duck harvested in this state followed by mallards and black ducks. "On-the-ground" waterfowl surveys revealed that 1,391 snow geese were harvested during the new snow goose season in 1975-76. In December of 1975, aerial photo counts revealed that over 39,000 snow geese were in this state utilizing winter feeding areas.

In order to assess the magnitude and consequence of land development and water control projects on wildlife habitat, division personnel conducted environmental reviews on 28 projects during 1974-

Waterfowl management includes the flooding of impoundments constructed primarily in the coastal counties. Both permanent and portable pumping equipment (shown here) is being used to increase the productivity of the habitat.

75 and 66 projects during 1975-76. Recommendations for minimizing any deleterious effects on wildlife habitat posed by these projects were made by the investigating biologist.

As reported in the last biennium, North Carolina's wild turkey restoration efforts are directed towards restocking the vast mountain areas with live-trapped, wild turkeys. Since 1970, 248 turkeys have been relocated on 11 areas. During 1975-76 the second largest number of turkeys ever relocated in a fiscal year in North Carolina were moved to various restoration areas in the west. Fifty-seven turkeys were trapped and relocated. This accomplishment was attributable to a great increase in the number of personnel — about 15 — participating.

Other accomplishments related to turkey restoration during the two-year period, included the preparation of maps showing occupied range in this state. Also, a statewide management plan was prepared, and a pamphlet on live-trapping techniques was written and published for use by professional and technical personnel.

The black bear continued to receive a great deal of attention in North Carolina. During the biennium, the Commission participated in a Cooperative Black Bear Research Program which also includes the states of Georgia and Tennessee. The purpose of this program is to combine the various resources of these states into a cooperative investigative effort. The overall goal is to insure future huntable populations of this big game species through better management techniques.

North Carolina's effort in black bear research during this period included a continuation of the sanctuary evaluation program through a radio-telemetry study. A total of six bears was "radio collared" in 1974-75 on the eastern study area to determine the daily, seasonal and annual movement patterns in typical eastern North Carolina bear habitat. Movements were monitored on seven bear in 1975-76. A study to monitor the status of black bear throughout this state continued. Data from bears harvested during the normal hunting seasons and those killed due to accidental causes (road kills) were collected to aid in determining such biological parameters of interest to biologists as reproductive success and age structures.

In order to effect the proper management of white-tailed deer populations, the Division's wildlife biologists conducted a variety of surveys throughout North Carolina. Over 800 miles of survey line were run in 1975-76 to gain information on population levels in several study areas. Over 20,000 hunters were interviewed statewide during the biennium. Information such as

Timber was harvested in various locations throughout the State compatible with wildlife habitat interests. Forestry and wildlife management plans were carefully coordinated.

the number of deer killed and hours hunted were recorded during these interviews.

The Division coordinated a wildlife disease study program in North Carolina in conjunction with the Southeastern Cooperative Wildlife Disease Study centered at the University of Georgia. Wildlife biologists investigated disease reports and collected specimens for analysis in 17 reported wildlife disease case outbreaks during the period.

A mail survey of North Carolina hunters was conducted during the 1974-75 season. In terms of number of hunters, deer moved into second place behind squirrels as the two game species most hunted in this state. Doves continued to rank first in terms of numbers harvested per trip. Doves per trip averaged 3.6 in 1974-75. Quail ranked second at 1.9 per hunter trip and squirrel came in third at 1.4 per trip. North Carolina hunters made a whopping 5,455,030 hunting trips during the 1974-75 survey period in pursuit of the major game species hunted in this state.

The major findings of this most recent survey were published in the July issue of **Wildlife in North Carolina.**

Values and Ranking of Game Species by Declared Hunters, Participating Hunters, and Hunting Trips in North Carolina

				Game Species Rating		
Species	**Declared Hunters**	**Participating Hunters**	**Hunting Trips**	**Declared Hunters**	**Participating Hunters**	**Hunting Trips**
Squirrel	224,215 (2.5)*	191,010 (3.1)	1,131,111 (5.9)	1	1	2
Deer	174,550 (2.7)	161,860 (2.7)	1,302,260 (6.8)	3	2	1
Rabbit	190,982 (2.1)	161,427 (1.7)	949,244 (4.6)	2	3	3
Dove	153,826 (2.3)	131,888 (2.4)	627,691 (4.0)	4	4	5
Quail	127,304 (2.6)	103,833 (4.0)	779,413 (8.8)	5	5	4
Ducks	39,771 (5.2)	34,278 (7.7)	264,542 (13.2)	7	6	7
Raccoon	42,908 (7.5)	33,964 (8.1)	332,277 (16.8)	6	7	6
Grouse	20,071 (8.7)	16,340 (8.5)	38,154 (14.6)	8	8	12
Fox	13,211 (11.7)	9,180 (12.1)	88,295 (22.7)	9	9	8
Bear	9,865 (13.5)	8,267 (16.2)	39,730 (26.1)	11	10	11
Geese	10,848 (12.8)	7,760 (14.3)	55,297 (24.0)	10	11	10
Other Species	9,227 (10.5)	7,251 (15.3)	60,177 (14.8)	13	12	9
Woodcock	9,260 (13.8)	5,966 (17.3)	26,849 (23.8)	12	13	13
Turkey	6,591 (13.7)	4,071 (16.4)	14,571 (42.9)	14	14	14

*Proportional Standard error expressed as a percentage appears in parentheses to the right of each figure.

Location and number of woodcock banded in North Carolina from 1 July 1975, to 30 June 1976.

County of Banding	Number: Mature	Number: Chicks	Total
Hyde	341	0	341
Chowan	3	0	3
Wake	9	4	13
Chatham	18	1	19
Buncombe	0	1	1
TOTAL	371	6	377

Ring-Necked Pheasant Observation, Pungo National Wildlife Refuge
March, 1973 - June 30, 1976

Month	March-June, 1973	1973-1974	1974-1975	1975-1976	Total
July	NA	21	2	1	24
August	NA	10	8	1	19
September	NA	9	0	1	10
October	NA	36	26	13	75
November	NA	2	2	1	5
December	NA	1	4	2	7
January	NA	1	6	5	12
February	NA	0	4	3	7
March	12	6	13	0	31
April	20	13	2	0	35
May	24	3	2	2	31
June	18	2	2	0	22
TOTAL	74	104	71	29	278
TOTAL BROODS OBSERVED	0	6	4	0	10

DIVISION OF GAME TABLES

Wild Turkey Relocation, 1975-76

Time	Area of Capture	Adults M	Adults F	Juveniles M	Juveniles F	Place of Release
1975, fall	Rich Mt., Mad. Co.	0	3	2	3	Dysartsville G. L., McDowell Co.
1975, fall	Rich Mt., Mad. Co.	1	0	2	0	Rich Mt., Madison County
1975, fall	Mill Ridge, Mad. Co.	2	0	0	3	Dysartsville G. L.
1975, fall	Green River G. L.	0	0	3	2	Dysartsville G. L.
1975, fall	Flat Top, Yancey Co.	1	0	0	0	Dysartsville G. L.
1975, fall	Mt. Mitchell, McD. Co.	1	0	0	0	Dysartsville G. L.
1976, spring	Caswell G. L.	3	8	5	1	Black Mt., McDowell Co.
1976, spring	Caswell G. L.	2	0	3	0	Caswell Game Land
1976, spring	Camp Lejeune	1	1	3	0	Brice's Cr., Croatan N. F.
1976, spring	Standing Indian	3	3	4	5	Cowee area, Macon Co.
1976, spring	Standing Indian	0	0	2	0	Standing Indian, Macon Co.
TOTALS		14	15	24	14	

GRAND TOTAL: 67; 57 relocated

Statewide Kill and Hunting Activity
As Tabulated From the 1975 Federal Waterfowl Status Reports

Year	Number Adult Hunters	State Goose Kill	State Duck Kill	Seasonal Kill Per Hunter	Rank in Atlantic Flyway Kill
1966-67	24,690	12,900	116,700	4.55	6th
1967-68	22,440	12,800	118,800	5.12	5th
1968-69	21,990	7,700	100,200	4.41	7th
1969-70	26,660	5,800	119,400	4.30	10th
1970-71	31,660	13,400	172,600	5.26	6th
1971-72	29,900	10,000	131,500	4.25	7th
1972-73	25,239	6,268	127,227	4.87	4th
1973-74	23,585	8,674	92,696	3.71	9th
1974-75	20,525	9,003	134,010	4.59	8th
1975-76	18,869	10,151	98,469	5.04	5th
Averages	24,556	9,670	121,160	4.61	7th

Species Composition of North Carolina Waterfowl Kill
Taken from Wing Collection Data, 1972-1975

Species	1975	1974	1973	1972
Wood duck	23.5%	26.1%	27.7%	30.9%
American widgeon	16.0%	12.3%	6.0%	7.9%
Mallard	12.4%	10.8%	13.2%	18.7%
Green-winged teal	8.9%	8.1%	10.1%	9.2%
Ringneck	7.6%	7.7%	11.2%	6.0%
Black duck	5.4%	6.0%	7.5%	8.9%
Gadwall	4.5%	2.9%	1.8%	2.0%
Pintail	4.2%	6.6%	4.2%	4.6%
Bufflehead	3.4%	2.9%	5.3%	3.5%
Ruddy duck	3.3%	2.3%	0.6%	0.5%
Blue-winged teal	2.3%	2.9%	3.0%	0.3%
Lesser scaup	2.2%	2.5%	1.1%	2.6%
Scoters	2.2%	4.3%	0.2%	0.8%
Shoveler	1.7%	1.9%	2.0%	0.5%
Hooded mergansers	1.1%	1.1%	1.5%	1.2%
Greater scaup	0.8%	0.5%	0.6%	1.3%
Large mergansers	0.3%	1.3%	2.6%	0.4%
Canvasback	0.1%	0.0%	0.0%	0.1%
Goldeneye	0.0%	0.0%	0.6%	0.4%
Old squaw	0.0%	0.0%	0.6%	0.1%
Redhead	0.0%	0.1%	0.5%	0.1%
TOTALS	99.9%	100.3%	100.3%	100.0%

INTERAGENCY WILDLIFE COORDINATION SECTION

THE Interagency Wildlife Coordination Section was officially established as part of the Director's office on August 1, 1974. Staff consisted of a chief, assistant chief, a secretary, a field crew leader, a field crew member and temporary laborers to assist the field crew. One of its major functions was review of environmental impact statements to ensure that government-funded programs adequately provided for protection of fish and wildlife resources. Another important segment, performed by the field crew, was the inventorying of fish and wildlife and its habitat in watersheds under consideration for PL 566 programs by the Soil Conservation Service. A third major area of activity was the development of channels of communication with other state and federal agencies to help guide their efforts in directions that would be supportive of wildlife conservation. The fourth major function of the Section was development of an endangered species program in consonance with federal guidelines. Some of the more significant accomplishments in each of these areas are described below.

Review of environmental impact statements required a substantial portion of staff effort. The largest number was concerned with applications for state and federal permits to perform dredging or filling in coastal estuaries and marshlands. Those having a potentially adverse impact upon fish and wildlife resources were recommended for denial unless they were modified to accommodate recommendations designed to prevent such damage. Another group consisted of plans for construction of waste treatment facilities and a third major group was concerned with highway construction plans. Staff review identified those that required investigations by game or fish biologists and their recommendations were transmitted to the construction agencies.

Watershed inventory work of the field crew is summarized in the following tabulations:

WATERSHED	COUNTY	ACREAGE	STATUS
Tri-Creek	Rowan	87,431	Completed
Coddle, Coldwater, Dutch Buffalo	Rowan, Iredell, Cabarrus	174,317	Completed
Limestone, Muddy	Duplin	60,591	Completed
Chicod	Pitt, Beaufort	35,100	Started
Little Contentnea	Pitt, Greene, Wilson, Edgecombe	115,155	Started
South Yadkin	Alexander, Wilkes, Iredell	1176,320	Started

Each of these inventories included a listing of fish populations and benthic organisms, a determination of water quality including several specified parameters, a listing of major wildlife species and a habitat cover map with primary plant species identified, and a survey of fish and wildlife utilization by hunters, fishermen and others. This information will be used as baseline data in the development of watershed improvement projects sponsored by the U. S. Soil Conservation Service under the PL 566 program. With this information at hand, it will be possible to design these projects in a way that will enhance production and utilization of fish and wildlife resources. This work was done under contract for and funded by the Soil Conservation Service.

Coordination with other state

Interagency wildlife coordination staff inspects a stream renovation project which shows promise as a substitute for stream channelization.

agencies was primarily centered within the Department of Natural and Economic Resources. Work with the Division of Forest Resources included development of a procedure providing for assistance of wildlife enforcement officers in the enforcement of the ban against felling of trees into streams, monitoring the impact upon fish and wildlife of chemical tree planting site preparation and development of seeding practices to improve wildlife habitat on such planted areas. Staff also participated in the work of the forest practices study committee and the development of the State's long range forestry program.

Coordination with the Division of Resource Planning and Evaluation included work on the Environmental Assessment Committee, offshore oil facility studies, 208 regional planning for non-point source water pollution control, use of remote sensing to map resource areas, development of the state's water plan, and study of such special projects as diversion of water from Gaston Reservoir and the North River as well as a proposed pump storage electrical generating project on the headwaters of the Roanoke River.

Work with the Coastal Resources Commission included the writing and publication of a manual entitled "Wildlife and Land Use Planning" for use in the preparation of land use plans for the 20 coastal counties. It also involved review of these plans after they were prepared and assisting in the development of criteria for designation of areas of environmental concern.

Section staff participated with the Division of Parks and Recreation in the development of master plans for public lands surrounding the Jordan and Falls of Neuse Reservoirs and the development of plans for the State Zoo at Asheboro. They provided information on the fish and wildlife resources of the New River as well as several others under consideration for natural or scenic designations.

Work with the Division of Environmental Management included preparation of fish and wildlife guidelines for 201 waste water pretreatment plans as well as review of such plans. Staff also cooperated with the Land Quality Section of the Division in the monitoring of soil erosion and stream siltation as well as review of dam safety plans.

Coordination with the Division of Marine Fisheries included review of dredge and fill applications and development of the endangered species program for species occurring under the joint jurisdiction of both agencies. Work with the Division of Economic Development included development of water intake plans for a new wood processing plant on the Roanoke River so as to preclude damage to striped bass and other species.

Work with N. C. State University included monitoring study projects sponsored by the Water Resources Research Institute and review of proposals for new studies. Land application of waste water was stressed as a means of inexpensive treatment and expeditious recycling of nutrients with greatly reduced impact on water resources. Staff also participated on the Task Force on Rural Environments and presented lectures on wildlife management and endangered species to university classes.

Coordination with the N. C. Department of Transportation other than review of new construction proposals included initiation of a study to develop designs and specifications for structural elements essential to trout habitat in situations where road construction required the moving of trout streams. Staff also helped DOT develop work plans to minimize impact upon individual roadside colonies of the endangered red-cockaded woodpecker and sponsored joint inspection of a proposed highway location through the habitat of a species of snail nominated for endangered designation.

The Section coordinated Commission interests with several federal agencies. In addition to review of applications for dredge and fill per-

The Wildlife Commission's Sandhills Game Land constitute a major reservoir for the preservation of the endangered red-cockaded woodpecker (left). The northernmost breeding colony of the endangered brown pelican (above) is located on Shell Island near Ocracoke.

mits to the U. S. Corps of Engineers, they also participated in enforcement review sessions sponsored by that agency and reviewed major corps projects under study for construction such as the Randleman Reservoir, the extension of Wilmington Harbor and the management of dredge spoil islands.

Work with the U. S. Soil Conservation Service, other than watershed inventory, included field inspections of proposed watershed projects and assistance with comprehensive basin planning of the Roanoke and Chowan Rivers. Section staff assisted with the out-of-court settlement of the Chicod Creek channelization litigation. Of particular significance was the preparation of a statement of policy regarding stream channelization that was adopted by the Wildlife Commission. This statement set forth in clear and explicit terms the extent of stream channel modification that would be acceptable to wildlife conservation interests.

The Section worked closely with the U. S. Fish and Wildlife Service in the review of dredge and fill applications as well as on resolution of problems related to stream channelization and endangered species. The Section also worked with the TVA in developing guidelines for river cleanup projects and with the U. S. Forest Service in review of wildlife aspects of Unit Plans for Management of National Forests.

The fourth major activity of the Section — that having to do with endangered species—involved presentation of a proposed model act to the State Legislature. Due to the lateness of presentation and pressures to terminate the session, no action was taken on the bill. Subsequent review of existing Commission authorities by the legal branch of the U. S. Office of Endangered Species resulted in the finding that such authorities were adequate to qualify the Commission for participating in the federally-funded program.

Streams in proposed Soil Conservation Service watershed project areas were studied to develop project guidelines designed to protect and improve fish and wildlife habitat and recreational opportunity.

Other work on endangered species included participation in a symposium on endangered animals and another one on endangered plants, development of guidelines for management of the red-cockaded woodpecker on the Sandhills Game Land and a plan for preservation of a colony on the Falls of Neuse Reservoir lands. Other work on the red-cockaded included inspection of habitat on Fort Bragg, development of preservation plans in conjunction with highway construction projects and compilation and transmission of data on known colonies in the state to the Red-cockaded Recovery Team.

Coordination was effected with the Division of Marine Fisheries toward the development of a cooperative agreement for work on species over which joint jurisdiction will be required. These are the Florida manatee, the short-nosed sturgeon, and three species of sea turtles. The nesting habitat of the northernmost colony of brown pelican (on Ocracoke Island) was inspected under the guidance of the state's foremost authority on this species. An inspection trip was also made of the habitat of the only known colony of the Nantahala middle-toothed snail in Swain County.

A cooperative program of stream monitoring was developed with the N. C. Division of Forestry to prevent felling of trees into streams by loggers.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

A New Year

This really isn't news, but it should remind us that several things "run out" in addition to the 1976 calendar. Motorboat owners should remember to renew their craft's certificate of number; fishermen brave enough to try their luck this time of year should buy their 1977 fishing license (hunters and combination license holders have until next August to get their new one); deer season closed January 1.

Nature Photography Contest

Complete details will appear in the February issue of "Wildlife," but nature photographers are reminded that the State Museum of Natural History is conducting the Second Annual North Carolina Nature Photography Contest. Deadline for receiving entries is March 22, 1977. Only North Carolina residents are eligible to enter and complete details are available from David S. Lee, N. C. State Museum of Natural History, PO Box 27647, Raleigh, NC 27611.

Boating Courses

Although there are lots of boating opportunities all year long in North Carolina, this may be a good time to sharpen your boating skills by attending a local boating course offered by a local flotilla of the U. S. Coast Auxiliary or other agency. Watch your newspaper for details.

Migratory Birds

Dove hunters have until January 15; woodcock hunters can pursue their quarry until January 22; Wilson snipe January 15; Canada, snow and blue geese, January 20; and ducks January 20.

Carolina Conservationist Program

A good supply of the 16 by 20 inch, limited edition (1,000) lithographs of the red-cockaded woodpecker is still available. This high-quality lithograph is signed by the artist, Duane Raver, and all proceeds from the sale of this item go toward the management of non-game wildlife species including the red-cockaded woodpecker. For a contribution of $25.00 or more, you will receive the lithograph.

DIVISION OF EDUCATION

PUBLIC interest in North Carolina's rich heritage of wildlife is undoubtedly at an all time high. People are more concerned about the future of fish and game and the other wildlife species that inhabit this State. People are also concerned about the environment, and more and more have begun to realize that the health and well being of wildlife species serve as a barometer of the health of our environment. It has been appropriately said that man cannot live in a world that will not support wildlife.

In this climate of interest and concern, the role of the N. C. Wildlife Resources Commission's Division of Education becomes increasingly critical. It is not enough simply for people to care about a future for wildlife and a safe environment—they must also have sound biological knowledge of how it all fits together. Without factual information, the public cannot help make and support the proper and necessary decisions.

It is the Division of Education's responsibility to provide the public with up-to-date and accurate information concerning the status of wildlife populations in the state, and provide educational guidance to the public about the needs of wildlife populations. This is especially important in an age when misinformation about wildlife is rampant. It is also part of the Division of Education's role to inform the public what the Wildlife Commission is doing to enhance wildlife populations, and what they, the public, can do to help wildlife and its habitat.

Publications

WILDLIFE IN NORTH CAROLINA magazine is one of the most widely recognized publications in the state. With a circulation in excess of 66,000, it is familiar to school children, senior citizens and all ages in between. Because of this, it is one of the most effective educational and informational tools of the Division of Education.

During the current biennium, a drop in circulation has been one of the major concerns of the Division of Education. At the beginning of the biennium, circulation was in excess of 100,000, but partly as a result of a price increase from $1 to $2 per year, circulation fell to around 60,000 at one point. The appointment of an assistant editor and circulation manager along with efforts to revise and standardize circulation procedures shows promise of helping regain much of the lost circulation.

Several new informational publications were prepared and put into service during the biennium, and many older publications were revised and updated. These include emphasis on the new Carolina Conservationist program which enlists the aid of nonhunters as well as licensed sportsmen in an effort to provide increasing funding for nongame and endangered wildlife species.

The Division of Education also assisted other divisions in providing layout, design, photographs and otherwise aided in the preparation of publications particularly suited to various management and research programs. The Division of Education played a vital role in the revision of the game and fish regulation brochures—a major change which has helped the public more easily gain information.

Press

The Division of Education made a concerted effort to upgrade services to the news media during the biennium, and the result has been greatly increased use of press releases, columns, and newsletters. A new WILDLIFE NEWSLETTER, published monthly, was designed and put into production. It is designed to cover the many activities of various Commission divisions, and has proved increasingly popular. Approximately 80 releases on

Production of the magazine "Wildlife in North Carolina," including the preparation of much of the art work (above) required a great deal of time during the biennium. Filming of television spots (below) and segments for future motion pictures often took the camerman "on location."

spot news items of timely interest were prepared during the biennium. Many of these releases impart vital information about regulation changes.

In addition, the weekly newspaper column WILDLIFE AFIELD continued to be widely used by the State's weekly and daily newspapers. A survey of use of this column indicates that some 120 newspapers are using it. Liaison with outdoor editors was excellent during the biennium, and special features were produced as a result of cooperation between the Division of Education personnel and reporters.

The Division of Education also assisted other Commission divisions —principally the Division of Game and Division of Inland Fisheries— in the production of numerous features and releases to local news sources.

Photography

There was an increasing shift to the production of color photography for use in WILDLIFE IN NORTH CAROLINA and in slide shows. Several new slide shows were prepared and division personnel spent many hours and days gathering thousands of color transparencies. Production of black and white photographs—including darkroom work—also continued to occupy a great deal of time. A new filing system was devised for both color and black and white negatives and finished photos. New 35 mm camera equipment and a polaroid I. D. system were purchased and have been in almost constant use by division personnel.

Division of Education personnel visited many schools (above), civic clubs, and other groups, bringing the wildlife message. Several major displays were arranged similar to the one shown below at the State Fair. Other divisions furnished equipment and personnel at some of these exhibits in order to bring the Commission's story to the public.

Radio-Television

The production of television spots was a primary activity during the biennium, and these spots were seen by millions of television viewers during prime time. They concerned such diverse subjects as bear research, turkey restoration, deer restoration, habitat destruction and magazine production. Surveys show that these TV spots had a favorable impact and may reach more people than all our other efforts combined.

No regular radio program was prepared by the Division of Education during the biennium because of a lack of funds and shortage of personnel; however, a survey was conducted to learn of the potential for use of radio and plans call for the possible installation of a new radio program early in the next biennium.

Education Division personnel were active in assisting TV and radio stations in the production of several special shows on wildlife subjects, and liaison with the audio-visual media remained effective. Division personnel are producing a TV program regularly at Channel 6 in Wilmington for airing on the Slim Mims early morning show.

Film Production

The production of two major films was undertaken by the Division of Education during the biennium. Thousands of feet of 16mm color film have already been shot in the production of a film on fishing management in North Carolina. This film will be almost entirely staff produced.

Work is also progressing on a second film which will tell the public about the many and varied activities of the North Carolina

Wildlife Resources Commission. Early work, including a film treatment, has already been completed, and the actual shooting of the film will begin after a company is selected to produce the film. Still, much of the production will be handled by the Division of Education staff.

Film Library

A new cleaning and processing machine has improved the Division of Education's ability to repair our many films and keep them in service to the public. Films have been updated and the library streamlined to get rid of those prints which were no longer usable or current.

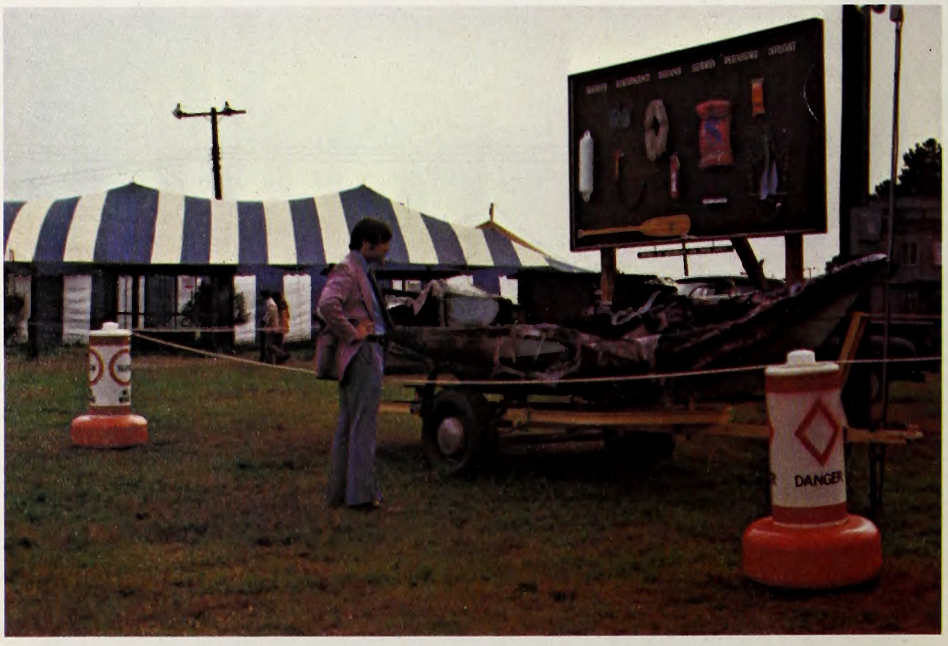
Education-Extension

Division personnel involved in extension work continued to work closely with public schools and youth groups, the State Museum of Natural History and other state agencies. Efforts to reach younger groups were intensified, and frequent contacts were made with such groups as the Future Farmers of America, Boy Scouts, Girl Scouts, and 4-H clubs.

Hundreds of requests from the public for information on wildlife and related subjects were answered during the biennium. Various pieces of literature, brochures, pamphlets, etc., were sent in response to many of these inquiries.

Wildlifer

An in-house monthly newsletter continued to be a popular and useful tool in helping the divisions and personnel stay informed about various Commission activities. The publication is particularly helpful because it opens a vital communications link between central office and field personnel.



Various communications means were employed by the Division of Education during the biennium, including information booths at strategic locations (upper right) school science camps (above), and the N. C. State Fair (right). Thousands of requests for information were also filled by correspondence.

DIVISION OF MOTORBOATS AND WATER SAFETY

THE responsibility of administering the state boat law, and making our waters safer and more enjoyable, rests with the Wildlife Resources Commission, and is shared by the Division of Motorboats and Water Safety and the Division of Enforcement.

The principal change in recreational boating which occurred during the past biennium resulted from the enactment of a state law to comply with the federal law requiring the registration of all motorboats. This broadening of the registration law caused boats with motors under ten horsepower to be registered for the first time. Approximately 40,000 boats were affected by this new law.

Partly as a result of the increased revenue from these newly-registered boats, the Division of Motorboats and Water Safety was able to expand its services to the boating public in the program of access areas, waterway improvement, and boating safety education.

Access Areas and Waterway Improvement

During the biennium, the public's demand continued for additional boating access facilities and in response to these demands, 12 new access areas were opened to the public. The construction of these areas represents an investment of $111,178.00. The new areas are:

Perquimans, Perquimans River, Perquimans County
Oriental, Neuse River, Pamlico County
Greenville, Hardee Creek, Pitt County
County Line, Kerr Lake, Warren County
Kimball Point, Kerr Lake, Warren County
Henderson Point, Kerr Lake, Vance County
Hibernia, Kerr Lake, Vance County
Satterwhite Point, Kerr Lake, Vance County
Bullocksville, Kerr Lake, Vance County
Hidden Cove, Lake James, McDowell County
Elizabeth City, Pasquotank River, Pasquotank County
Cable Cove, Fontana Lake, Graham County

On June 30, 1976, 125 free public access areas were in operation and a site on the Alligator River at the old East Lake Ferry site in Dare County was under construction. In addition to the new areas completed, several existing access areas were expanded or renovated.

The statewide waterway marking program continued to expand to mark water hazards and navigation channels. During the biennium, 168 danger buoys, 16 channel buoys and five congested area buoys were installed. In addition, the division started a new program of marking bridge piers in navigable waters by placing high intensity reflective danger signs on the piers. A total of 200 reflective signs were installed on Lake Wylie, Lake Norman and Lake Tillery.

The stream clearance crews continued their work in removing obstacles to navigation in the smaller streams of the state. In this operation, only the obstructions necessary to permit the passage of small boats are removed. An estimated 100 miles of streams were opened in this manner.

Boating Safety Education

Dangerous boating practices claim lives, and cause hundreds of thousands of dollars in property damage, each year in North Carolina. One of the primary goals of the Division of Motorboats and Water Safety is to implement effective boating safety programs that will reduce the number of fatalities each year resulting from tragic boating accidents.

One hundred and two lives were lost in boating accidents on North Carolina waters during the biennium ending June 30, 1976. Capsizing and falls overboard were responsible for the vast majority of all deaths on the water. Most fatal accidents involved boats 16 feet in length and less, being operated by males between the ages of 20-29.

In 99 of the 102 fatal boating accidents, the operator of the boat had never received any formal boating instruction. This shows the need for better educated boat operators, and it was with this thought in mind that the Wildlife Commission began its efforts to reduce boating accidents through a boater education program.

This boating access area on the Pasquotank River near Elizabeth City was constructed by the field crew of the Division of Motorboats and Water Safety. It was one of the twelve new areas opened to the public during the biennium.

Boating safety representatives visited many schools during the biennium conducting boating and water safety courses and demonstrations. Here, the use of personal flotation devices is being shown to an interested group.

The waterway marking program was expanded during the biennium with 168 danger buoys and 16 channel buoys installed. These high-visibility markers were placed at potential danger spots such as underwater obstructions.

While several states were trying to reach adults with their education classes, which had the undesirable effect of competing directly with the excellent boating courses offered by the United States Coast Guard Auxiliary and the United States Power Squadrons, the North Carolina Wildlife Commission pioneered the way with a programmed text design boating education course for young people. The idea, of course, was to reach youngsters before dangerous habits and attitudes were formed. Approximately 125,000 young people completed the boating education course during the past biennium.

While our division's major emphasis in water safety has been directed toward young people, we have been able to increase our adult education programs also. The Division of Motorboats and Water Safety has published two new boating booklets and distributed them and other educational booklets and posters to marinas and places boaters frequent. A boating safety television spot and several slide TV spots were produced and distributed to television stations in North Carolina and those stations in bordering states who broadcast into this State. Our boating education representatives were present with boating safety displays at most boat shows throughout the state to answer any boating questions the general public might have.

Our division is also charged with the responsibility of investigating requests for local boating regulations. While we support local regulations designed to eliminate specific boating hazards, we must weigh the benefits of a regulation against the possible undue burden placed on boaters using the waters. We then must make a recommendation, based on our findings, to the Wildlife Commission for its decision on the matter.

Cooperative efforts in the field of boating safety with the Coast Guard, Coast Guard Auxiliary, Power Squadrons, Red Cross, Army Corps of Engineers, local water safety organizations, state agencies and other states were highly successful in promoting safer boating in North Carolina.

Of particular importance during the past biennium was a joint study by the Medical Examiners Office and the Wildlife Resources Commission concerning the use of alcohol by boaters and its impact on boat operation. This joint study has given us some hard facts into the problem of alcohol on the water. Initial results from the study have indicated that two out of every three victims given toxicology tests following a boating accident were found to have been drinking prior to the accident. Of those who had been drinking, over fifty percent had enough alcohol in their blood to be considered driving under the influence had they been in a motor vehicle. This study and others continue and may some day be the basis for a request by the Wildlife Commission to the General Assembly for legislation aimed at reducing the number of lives lost in boating accidents.

Funds for the activites of the Division of Motorboats and Water Safety are provided by the registration fees collected on motorboats, from a small portion of the state tax on gasoline, and from money made avaliable by the United States Coast Guard under the Federal Boating Safety Act of 1971.

Ours is a program dedicated to returning the boaters' fees in the form of services.

WILDLIFE RESOURCES COMMISSION BUDGET SUMMARIES

CODE 26741
WILDLIFE BUDGET
JULY 1, 1974 - JUNE 30, 1976

EXPENDITURES

	1974-75	1975-76
I. Administration	$ 202,494.78	$ 219,420.73
Administration—Interagency Wildlife Coordination	95,578.48	96,827.91
II. Administrative Services—Finance	368,612.16	388,947.61
Administrative Services—Data Processing	121,255.75	131,316.07
III. Wildlife Enforcement	3,021,226.51	3,285,302.37
IV. Education	282,796.75	267,785.04
Hunter Safety	84,662.89	87,689.85
V. Inland Fisheries—Administration	38,393.27	37,962.41
Inland Fisheries—Production	459,005.50	441,471.05
Inland Fisheries—Management and Research	428,547.03	412,082.28
VI. Game—Administration	163,596.08	41,969.77
Game—Game Lands Management	1,100,657.80	1,402,659.70
Game—Services	448,640.93	386,095.05
VII. Special Fund—Reserves	179,002.00	105,605.00
Transfers	33,016.00	184,721.00
Refund of Receipts and Expenses	390,853.83	267,376.68
Total Expenditures	$7,418,339.76	$7,757,232.52

RECEIPTS

	1974-75	1975-76
Hunting and Fishing Licenses	$4,695,206.46	$6,315,717.63
Management Area Receipts	200,098.29	151,650.86
Federal Cooperation	1,367,876.91	1,454,710.88
Miscellaneous Receipts	65,100.59	21,687.52
Sale of Publications	79,965.91	95,912.36
Sale of Surplus Property	24,815.96	60,561.71
Rent of State Property	9,818.20	7,733.70
Reimbursement from Motorboat Fund	241,509.00	361,607.00
Donations	15.50	191.00
Refund of Receipts and Expenses	390,853.83	267,376.68
Reversion from Capital Improvement Fund	3,425.36	
Transferred from 1973-74 for Deferred Obligations	60,752.00	
Transferred from 1974-75 for Deferred Obligations		33,016.00
Total Receipts	$7,139,438.01	$8,770,165.34

SUMMARY OF OPERATIONS

	1974-75	1975-76
Funds transferred from preceding year	$1,316,926.23	$1,038,024.48
Gross Receipts for year	7,139,438.01	8,770,165.34
Total Available Funds	$8,456,364.24	$9,808,189.82
Less Expenditures	$7,418,339.76	$7,757,232.52
*Operating Reserve—June 30, 1975	$1,038,024.48	
*Operating Reserve—June 30, 1976		$2,050,957.30

*This operating reserve is to meet payrolls and other obligations during the months of July, August and September each year when revenue from hunting and fishing license sales is very low.

MOTORBOAT BUDGET — CODE 26743
JULY 1, 1974 - JUNE 30, 1976
EXPENDITURES

	1974-75	1975-76
X. Administration	$ 38,011.29	$ 41,899.64
XI. Boating Safety	97,734.41	80,974.75
XII. Registration	123,078.20	154,695.76
XIII. Engineering	295,680.12	284,014.60
XIV. Transfers	271,839.00	372,069.00
Refund of Receipts and Expenses	9,872.18	4,438.95
Total Expenditures	$836,215.20	$938,092.70

RECEIPTS

	1974-75	1975-76
Registrations—Boats	$376,579.25	$ 738,901.19
Gasoline Tax Refund Allocation	272,398.96	279,595.78
Miscellaneous Receipts	162.50	356.48
Federal Aid—Boating Safety	35,517.00	162,103.00
Refund of Receipts and Expenses	9,872.18	4,438.95
Transferred from 1973-74 for Deferred Obligations	20,510.00	
Transferred from 1974-75 for Deferred Obligations		330.00
Donations		30.50
Total Receipts	$715,039.89	$1,185,755.90

SUMMARY OF OPERATIONS

	1974-75	1975-76
Transferred from preceding year	$227,536.50	$ 106,361.19
Gross receipts for year	715,039.89	1,185,755.90
Total Available Funds	$942,576.39	$1,292,117.09
Less Expenditures	$836,215.20	$ 938,092.70
*Operating Reserve June 30, 1975	$106,361.19	
*Operating Reserve June 30, 1976		$ 354,024.39

*The operating reserve is to meet payrolls and other obligations during the months of July, August and September each year when revenue from motorboat registrations is very low.

Upon request, you will receive a copy of the detailed, line-item Wildlife Resources Commission Budget for the Biennium 1974-1976.

SUMMARY OF COMMISSION RECEIPTS FOR TEN YEAR PERIOD 1966-67 - 1975-76

The following table gives a picture of the growth in Wildlife Revenue during past ten years.

FISCAL YEAR	RECEIPTS
1966-67	$4,039,229.00
1967-68	$4,325,366.00
1968-69	$4,522,591.23
1969-70	$5,778,336.50
1970-71	$5,409,248.19
1971-72	$5,915,883.10
1972-73	$6,602,387.49
1973-74	$6,900,133.05
1974-75	$7,139,438.01
1975-76	$8,770,165.34

FISHING LICENSES

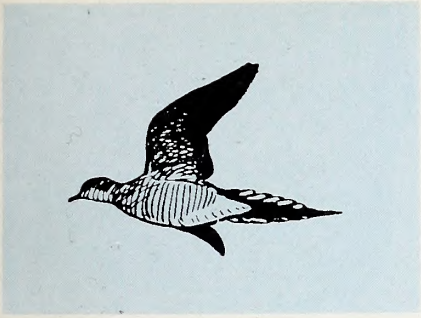
	1974		1975	
	Number	Amount	Number	Amount
Resident State Daily Licenses	56,455	56,455.00	56,020	56,020.00
Resident County Licenses	20,834	46,876.50	19,956	44,901.00
Resident State Licenses	167,953	839,765.00	165,784	828,920.00
Nonresident State Daily Licenses	21,646	43,292.00	21,770	43,540.00
Nonresident State 5-Day Licenses	18,031	72,124.00	19,841	79,364.00
Nonresident State Licenses	12,551	112,959.00	13,053	117,477.00
Resident Special Trout	66,279	132,558.00	65,015	130,030.00
Nonresident Special Trout	3,926	15,704.00	4,337	17,348.00
Miscellaneous Licenses	13,116	19,776.00	11,727	33,162.00
TOTALS	380,791	1,339,509.50	377,503	1,350,762.00

HUNTING LICENSES AND PERMITS

	1974-75		1975-76	
	Number	Amount	Number	Amount
Resident Combination Hunting and Fishing Licenses	228,465	1,599,255.00	177,460	1,685,870.00
Resident County Licenses	70,768	159,228.00	63,983	207,944.75
Resident State Licenses	126,392	631,960.00	105,772	740,404.00
Nonresident Licenses	7,193	154,649.50	6,479	158,735.50
Nonresident 6-Day Licenses	2,282	39,364.50	2,248	43,836.00
Resident State Trapping Licenses	2,165	8,660.00	1,520	14,440.00
Resident County Trapping Licenses	1,581	4,743.00	2,003	9,013.50
Controlled Shooting Preserve Licenses	368	2,208.00	365	3,467.50
Primitive Weapons Hunting Licenses	--	--	4,979	22,405.50
Resident Sportsman's Hunting and Fishing Licenses	--	--	37,359	915,295.50
Nonresident Sportsman's Hunting and Fishing Licenses	--	--	173	8,563.50
Nonresident Big Game Licenses	--	--	4,179	18,805.50
Game Lands Use Permit	80,568	443,124.00	43,856	328,920.00
Resident Big Game Licenses	194,832	292,248.00	138,794	451,080.50
Miscellaneous	1,397	6,078.75	1,326	6,714.75
TOTALS	716,011	3,341,518.75	590,496	4,615,496.50

PERMANENT AND LIFETIME LICENSES

	1974-75		1975-76	
	Number	Amount	Number	Amount
Permanent Combination Hunting and Fishing Licenses for Residents Who Have Reached 65 Years of Age	5,528	55,280.00	6,109	61,090.00
Lifetime Combination Hunting and Fishing Licenses for Residents Who Have Reached 70 Years of Age—Free	3,551	--	3,561	--
Lifetime Combination Hunting, Fishing, and Trapping Licenses for Residents Who Are 50% or More Disabled	476	3,570.00	1,184	8,880.00
North Carolina Lifetime Hook and Line Fishing Licenses for Blind Residents—Free	91	--	55	--
TOTALS	9,646	58,850.00	10,909	69,970.00



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Wildlife

IN NORTH CAROLINA

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Ralph J. McDonald's "The Davidson Wildcat" was painted for the Wildcat Club, Davidson College's booster club. Only 1750 of this high quality 16 by 20 inch print are available signed and numbered. They can be obtained for $37.50, including postage, from "The Wildcat Club," Davidson College, Davidson, N. C. 28036.

North Carolina State Library
Raleigh

PHOTO BY LEONARD LEE RUE III

RED FOX

Red foxes and their cousins, the greys, are seldom seen, even against the snowy February landscape. Yet, both species are quite plentiful in many sections of the State.

The Other Side of the Mountain

by Lee Whitmire
Chapel Hill
Photos by the Author

BOB Cooley and I hoisted our heavy packs painfully to our backs, and adjusting the straps and buckles, headed up the Dry Branch access trail into the 36,000 acre Shining Rock Wilderness Area of Highway 276 near Waynesville. It was a typical January weekend, or so we thought at the time, with the daytime highs near 50 and the expected lows in the twenties.

For a couple of hours we hiked along in silence, getting the feel of the mountain and listening to the crashing white water of Dry Branch Creek. Then, as we set up camp about halfway to the top, it began to snow.

Saturday morning we crawled from the tent to find four inches of dry powder on the ground and the mercury at 15 degrees. It got colder as the day progressed. We broke camp in the numbing cold, and after a breakfast of hard boiled eggs, country ham, and hot chocolate, we began the grueling climb through fresh snow to the top.

By the time we reached Flower Gap and set up the tent in a sheltered grove of evergreens and laurel, the mercury had found the five-degree mark and we began to realize this was something out of the ordinary. I began melting snow for chocolate while Bob hiked on up to the summit.

Exhausted by the tortuous climb, we had a few cups of chocolate and tea for supper and zipped into our sleeping bags, miserably cold and longing for the safety and warmth of our apartments back in Chapel Hill 250 miles away. Sunday morning the thermometer painfully informed us it was 11 degrees below zero; the wind was hustling by about 30 miles an hour which our trusty wind chill chart informed us equalled out to better than 50 degrees below zero! We stood awed by the power of the mountain.

Saturday night, ignoring the warnings in so much of the literature we'd read, we left our boots outside of our sleeping bags. Sunday found them frozen like bricks, tongues askew and laces frozen across the leather. We forced them on, painfully cramping our bruised feet into the rock hard leather and hiked to the summit in an attempt to thaw them out enough to lace.

It was so cold the moisture from my breath froze into the hairs of my beard, creating a lumpy sheet of ice extending from moustache to dangle off the bottom of my chin, making speech nearly impossible without defrosting by tongue. Yet when we reached the quartz strewn summit, all the pain was gone. There, laid out 360° around us stretched the snowy crest of the Great Smokies, glimmering whitely in the golden light of the rising sun. Pisgah to the east, its massive ribs and roots etched in the cold morning as if painted by the brush of an ice giant, shaded subtly by

The trip started out in typical midwinter weather with rather pleasant 50-degree temperatures. Bob Cooley prepares with a little "preventative maintenance" on his feet at the beginning of the trip. But then things changed and by nightfall, the tent was surrounded by snow covered trees in a protective grove at Flower Gap. (Opposite page)

white snow and dark evergreens. Cold Mountain to the north, a slumbering, frozen leviathan beast, lying quietly in the snow until the new rays of the sun warmed it enough to awaken.

Evergreens and laurel shone with reddish-golden brilliance as they swayed in the gusty breeze. From the zenith westward the sky was a pure, royal blue broken by the silver setting moon. We realized without speaking that the price of admission was not too steep; that the pain and torture was a little bit to pay for the spectacle before us.

As we found out the hard way, on this our first real winter camping trip, winter operations are only successful when well planned and executed. You cannot simply throw your gear into the back of the pick-up or station wagon and head for the mountains. To do so is folly and could find you less fortunate than we were, as indeed happens to some every winter.

The National Park Service provides a mandatory list of equipment for winter backcountry travel in North Carolina's national parks and wilderness areas. You would be well advised to obtain a copy and not view it lightly. Everything on that list is there for a reason.

Some general and by no means complete guidelines for that first winter experience: Remember, the mountains are not always as unfriendly as they were to us; but the weather man up there is lucky if he can predict this afternoon's weather this morning, so you have to be prepared for the absolute worst the mountain can throw at you. To do otherwise is to beg for an invitation to the big campground in the sky, and its hypothermic mode of travel.

Speaking of hypothermia (exposure) , , , .

Being a warm-blooded mammal means that you have an interior thermostat striving to maintain your body temperature at approximately 98.6° F. As the outside temperatures drop, the core heat producing mechanisms must work harder to maintain body temperature. Hypothermia is brought on by prolonged exposure to outside cold air, causing body heat to escape and core temps to drop. It need not be excessively cold; last winter a man died on Mt. Mitchell from exposure with the air temperature around 50 degrees.

Frostbite occurs when the body thermostat, striving to maintain the core temperature, reduces circulation to the outer layer of skin. When this necessary circulation drops, ice crystals can form within the layers of skin and cause serious tissue damage. Bob suffered frostbite on his toes as a result of our foolish behavior in not protecting our boots.

Dehydration, surprisingly enough, is a serious problem in cold weather. Since frozen air is extremely dry, it leaches the moisture from our body, carried out by breath and perspiration, rapidly. Unfortunately, you hardly notice this happening. The average person is advised to drink two quarts of fluid daily in winter conditions!

Clothing is an important consideration. Loose fitting, tightly woven fabric, wool, goose down, etc., is the best. Cotton and denim, fine for the summer trails, are the worst possible combination for winter. Warmth depends on heated air trapped in "dead air" spaces among layers of clothing. Loose fit insures a gradual ventilation of moist, warm air out as it is replaced by body heat. Wool is best from long, wrist to ankle length undergarments to shirt and trousers. Suspenders for the pants are best, as they allow ventilation where a belt will restrict the flow of air. A quality down or fiberfill parka, with a waterproof shell, is insurance against hypothermia on rest stops and around camp.

The greatest areas of heat loss for most campers is the head, hands, and feet. A good, all wool hat, the kind with a full face covering that can be rolled down, is fine for the head. Mittens or gloves should have a protective shell over wool liners. As most hiking boots are atrocious insulators, wool socks, several layers, are necessary. And remember to put those boots, wrapped in a plastic bag, in the bottom of your sleeping bag. If they freeze, becoming impossible to wear, you are in TROUBLE!

For the weekend trip into the western N. C. mountains, chances are your nylon, single-layer tent will do. Some models can be equipped with a cotton frost liner, which attaches to the inside and provides more insulation and absorbs the moisture from sleepers' breath. It can be removed and shaken out before packing, reducing weight. (You'd be surprised how heavy a tent can get from the ice layers on the inside.)

Most people these days use a gasoline stove burning a pure, unleaded gas that self-generates the pressure necessary to produce a flame. In extreme cold these stoves will not function because the fuel tank cannot be kept warm enough to generate the necessary pressure. I purchased a little pump-cap that replaces the fuel cap on my Optimus and by using it we barely generated enough pressure to boil water. Had we not had that little pump, we would have been unable to keep the stove going and thus would have not been able to melt snow for water. I need not mention what the results could have been. You should remember that even

with a pump it will take longer, and more fuel, to do the same job as in warmer temperatures; so plan your fuel supply accordingly.

And while talking about stoves, we should also mention the food that cooks on them. Studies show that the average person needs about five or six thousand kilogram-calories a day when outdoors in sub-freezing weather. So take the food and more importantly, eat it! Due to the attitude impairment of the cold, Bob and I fixed no solid meals Saturday night or Sunday morning, the height of foolish stupidity. Fortunately, we are both big men with a lot of tissue to spare. Leaner, thinner types would not have been so lucky.

As you can plainly see, winter camping is no easy stroll among the rolling, friendly peaks. It requires effort and conscious attention to painful detail. Is it worth it?

Saturday afternoon, three-quarters of the way to the top, we encountered a crude wooden foot bridge spanning Dry Branch Creek. The split logs, undefiled by human or animal feet, were buried beneath a sparkling curvature of fresh snow, glimmering in the afternoon sun. A little higher up we found ourselves in a tunnel of snow where the trail cut through a grove of evergreens weighing ponderously beneath the weight of whiteness and forming an arched walkway of sparkling light dancing down amongst the icy needles, setting the little grove afire with reflected crystalline light.

With our feet crammed painfully into frozen boots, we stood on the summit Sunday morning watching little wind whipped "snow-devils" flittering across the white pathways and the rising sun setting the forests below ablaze with reddish-golden light. To the west we watched the silver-full moon slowly dip behind the flaming snowy mountain ridge along which the Blue Ridge Parkway runs, a bright disc set into the deep, ultra-blue of the winter morning sky, dipping inexorably to touch the tips of distant, white shadowed peaks. There was no sound save the wind and the low tinkling of snow from the laurel branches. Hearty chickadees, impervious to the cold and seeming to laugh at our discomfort, hopped and danced about in the snow, searching for little bits to eat. And occasionally, though we never saw the makers, we stumbled across fresh deer tracks in the snow.

The price is heavy, but worth it. It's not easy to enjoy the loneliness and solitude of the high places when winter locks the land, yet if you take the risk you'll come back a better person for it. We had the feeling somewhat like the old Cherokee hunting parties must have had as their quarry led them high on the mountain flanks; a staunch realization of the community of man and his land, that we are a part of, not master to, the land, the sky, and the mountains.

The author seems ready for it in winter regalia. The "gaiters" keep the snow out of boots. Clothing for cold weather must be selected carefully. Cold Mountain (below) looked just that way from the summit of Shining Rock. The scenery was worth the discomfort of the weather.

PHOTO BY BARBARA LEE

The Purple Gallinule

by Eddie Weaver
Biologist, Interagency Coordination Section

THE Purple Gallinule (*Porphyrula martinica*) is a game bird in North Carolina but is seldom taken probably because they are rarely found in huntable numbers. The bird is considered relatively common in South Carolina as a summer resident from April 10 to October, its breeding range being almost entirely southern, primarily in Florida. Lake Ellis Simon in southern Craven County holds the northernmost breeding record for the species in North Carolina and purple gallinules have been assumed to nest at Orton Plantation near Wilmington, N. C.

I found the purple gallinule nesting at White Oak marsh impoundment in northeast Onslow County on June 18, 1974. The arrival date in the breeding area was May 22. White Oak is controlled and maintained by the N.C. Wildlife Resources Commission within the statewide game lands system. The area is managed primarily for migratory waterfowl.

This species remained for a period of approximately eight weeks during which three to five nesting pairs were recorded. A total of six to ten individuals were residents during the month of June. In Florida, egg dates vary from April 10 to June 26, and in South Carolina recorded dates extend from May 28 to July 1. Thus the nesting date of June 18 appears to be rather late even for a more northern location.

Photos by the Author

This purple gallinule inspects a wooden skiff tethered in its marshy home. Southeastern North Carolina is apparently the northernmost limit of nesting activities of the purple gallinule (below).

The nest of the gallinule is a slightly hollowed heap of dead and shredded reeds placed in the center of a living cattail or needlerush clump. The eight inch in diameter nest is found only an inch or so above the water and is very exposed and obvious. The nest is so

• **continued on page 27**

The Harbinger of Spring

by Thomas A. Pierson
and
Ralph E. Mirarchi

"MAIDS! Maids! Maids! Hang up your teakettle-ettle-ettle!" Thus did the well-known author, Henry David Thoreau, describe the lively song of the song sparrow. The song sparrow, as one might guess from its name, is famous for its persistent and arduous singing. Song sparrows may be heard singing in every month of the year; at dawn, dusk, or any time in between; at night; on sunny days or during stormy weather; and even in hot, balmy weather or sub-zero temperatures. However, at no time of the year is the song sparrow more conspicuous or its song more often heard than in early spring, when winter first begins to loosen its icy grip on the land. Their cheery singing in early March is a welcome sign to all those who hear it for it foretells the warm days that lie ahead. "Maids! Maids! Maids! Hang up your teakettle-ettle-ettle," so proclaims the harbinger of spring!

The song sparrow is a medium-sized bird as sparrows go, measuring about six inches in length. It is brown above and darkly streaked along its back. The top of the head is brown with darker brown stripes running the length of the crown, behind the eye, and from the base of the beak. The grayish breast is heavily streaked and the markings converge to form a central breast spot. A good clue to the identity of the song sparrow is the long, slightly rounded tail which the bird pumps in flight.

Other names for the song sparrow include ground-bird, ground sparrow, hedge sparrow, and bush sparrow. These names reveal where one is likely to find the song sparrow, for it inhabits thickets, hedgerows, and brushy fields. The song sparrow shows a preference for areas near water, and though it is often found far from water, it is most abundant in the bushes along streams, around the margins of ponds, and in brushy meadows.

Despite all the names one might think of to describe this lively bird, none is more appropriate or fitting than song sparrow. Even the scientific name of the song sparrow, *Melospiza melodia*, alludes to its characteristic singing. *Melospiza* is Greek for "song finch," and *melodia* is Greek for "melody" or "melodious song." In the scientific scheme of classifying birds, the song sparrow belongs not only to the largest order, *Passeriformes*, which includes all the familiar perching birds, but the largest family, *Fringillidae*, which includes grosbeaks, finches, sparrows, and buntings, as well.

Most people think the reason birds sing so often each spring is that they share our joy and anticipation of the warm weather ahead. However the song has quite a different meaning. For the song sparrow, song is the chief means of proclaiming its territory. Once the territory is established the song also serves to attract a mate. Territoriality limits competition for food and ensures that each pair of birds will have enough food to feed themselves and their young.

Song sparrows may nest in woodland clearings, thickets and hedgerows, brushy fields, at the edge of streams, lakes, marshes, and swamps, in city parks and yards with plenty of shrubs, and in thickets on coastal sand dunes. The nest is made of grasses, weed stems, leaves, and bark fibers, and is lined with finer materials such as rootlets and hair. The female builds the

The song sparrow is often attracted to seeds scattered at a feeding station (opposite page). It generally sings from conspicuous perches (left, above). Song sparrows usually nest on the ground. This nest (left) was placed at the base of a clump of nodding thistle.

Photos by the Authors

nest, a task which, depending on the weather, may take from five to 10 days. The nest is usually placed on the ground, but may be built as high as 12 feet in a bush or tree. Nests are, on rare occasion, built in cavities.

The female lays from three to six eggs. The color of the eggs ranges from blue to blue-green to gray-green. Most eggs are heavily speckled, spotted, or blotched with reddish brown spotting more or less evenly distributed over the entire surface. The eggs hatch in 12 to 15 days, and the young are brooded by the female for the first five or six days of nest life. Young birds are fed insects, worms, beetles, grubs, flies, caterpillars, and grasshoppers.

The weight of the nestling increases more than 10-fold in the first 10 days of life. The young usually stay in the nest 10 days, leaving the nest before they can fly. Song sparrows will raise two or three broods of young each year, and once the young of one brood leave the nest and are able to fly, the female immediately begins to lay the eggs of the next brood, often in the same nest. The male continues to feed the young which become completely independent when 28 to 30 days old.

The song sparrow is one of the most frequent victims of the brown-headed cowbird. Cowbirds never build a nest of their own, but lay their eggs in the nest of other birds, who are left with the task of raising their uninvited guests. As many as seven cowbird eggs have been found in a single nest, and records of three, four or five eggs are common.

Song sparrows inhabit most of North America, from Alaska and southern Canada, southward. Throughout this extensive range, many different geographic races or subspecies of the song sparrow have been recognized. These birds are all song sparrows, but their color varies from rusty to gray and dark to light. A total of 31 subspecies have been recognized, and three more are known to occur in Mexico. Most of these subspecies occur west of the Rocky Mountains and in Alaska. Three subspecies may be found in North Carolina: the eastern, Atlantic, and Mississippi races. There is some question as to whether the eastern song sparrow breeds within North Carolina, but it is certain that both the Atlantic and Mississippi races do. The eastern song sparrow may be found throughout the state in the winter.

Not only do song sparrows from different parts of the country look different, but their songs may sound different as well. Studies have shown that even the same bird may be heard singing variations of his own song. However the song may sound, it has one distinct meaning to those who hear it in early spring. Winter is gone and the warmth of spring will soon flood the land. Listen, and you can hear from many an elevated singing perch, the harbinger of spring.

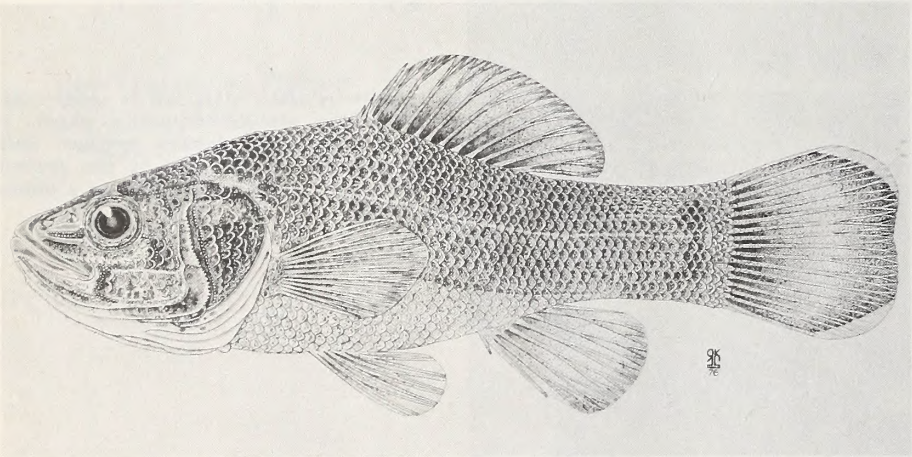
Note: For further reading on the song sparrow, see *Studies in the Life History of the Song Sparrow Parts I and II,* by Margaret M. Nice, or *Life Histories of North American Cardinals, Grosbeaks, Buntings, Towhees, Finches, Sparrows, and Allies, Part 3,* by A. C. Bent.

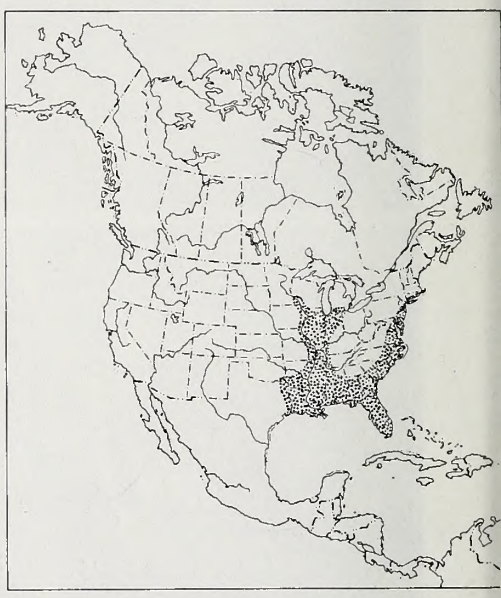
LESSER KNOWN FISHES OF NORTH CAROLINA FIRST IN A SERIES

The PIRATE PERCH

by Barbara B. Lee

Illustration by Renaldo G. Kuhler





The United States range of the pirate perch is shown above. In North Carolina it is restricted to the eastern half of the State.

THERE are many secretive little fishes which are seldom encountered by the fisherman. Although they are too small for game fish and impractical to catch for bait, they are, nevertheless, interesting. This is the first in a series of articles on some of the strange, lesser known fishes that commonly inhabit North Carolina's diverse aquatic habitats.

About 200 of the 700 species of freshwater fishes recorded from North America occur in North Carolina, but few of these rival the pirate perch as a truly unique fish. Its most striking feature is the position of the anal opening or vent, which is located under the throat rather than at the base of the tail. When a pirate perch first hatches from the egg, this opening is in the usual position, but during development it migrates forward to the jugular area in the adult. This is accompanied by an internal rearrangement of the gut and urogenital tract. What advantage this unusual arrangement has for this species will probably remain one of the mysteries of evolution. Some tropical species that carry their eggs and fry in their gill cavities have a similar body plan, but the advantages, even for the well-studied species, are not really clear.

In most other respects this dusky little fish, which seldom grows longer than four inches, looks rather ordinary. Zoologists who have studied this species closely, however, do not find it ordinary at all and have placed it in a family all by itself — the Aphredoderidae. Thus, the pirate perch is not a perch at all, but belongs to a group whose other members are extinct and known only from fossil remains.

The pirate perch is very common in most of our lowland creeks and streams and is occasionally found in larger rivers and lakes. It feeds on insect larvae, amphipods, smaller fish, worms, and glass shrimp. These are usually sucked into the mouth from the side as the fish swims up alongside its prey. Like the creatures it eats, the pirate perch is most active at night especially at dawn and dusk. It hardly moves during the day as it lies hidden near the bottom under a log or other cover. For this reason the fish is difficult to locate and their numbers difficult to assess in a given area.

Spawning takes place in the spring. It is reported that both parents guard the eggs and young.

Aphredoderus sayanus is essentially restricted to the Atlantic Coastal Plain and Mississippi River lowlands. An apparently isolated population is known in western New York. In North Carolina it is found throughout the Coastal Plain and the easternmost part of the Piedmont in slow-moving lowland creeks with sufficient bottom cover.

You may never see or catch a pirate perch, but while you're fishing you can know that somewhere this creature is living out its life, playing an invisible but vital role in the ecosystem of which it is an essential part. That bass or catfish you may be trying to catch is a part of that ecosystem, too, and indirectly dependent on the pirate perch as an important member of a healthy, complete biological community.

"To Do A Better Job"

by Joe Gallehugh, Jr.

● When Bill Crawley went back to school in March 1974, he didn't have anything to prove.

He was 45 years old, well settled in his job and had already put his two sons through college. He wanted to fulfill a dream he had ever since he graduated from high school.

Recently, two and one half years after he started night classes toward a degree, Crawley became the first career officer to receive an Associate in Applied Science Degree in Police Science from Bladen Technical Institute.

"I'd always wanted to go back to school," said the 19-year veteran of the North Carolina Wildlife Resources Commission, "ever since I graduated from high school—I always thought it would help me do my job better."

Crawley, who lives in Bladenboro, is an area leader, Enforcement Officer III, in Bladen County with the Wildlife Resources Commission.

The soft-spoken 245 pound Crawley likes his job enforcing the fish, game and boating laws of North Carolina and feels the police science degree has helped him do a better job.

"I guess the things that helped me the most," said Crawley, "are psychology and English courses. I find situations where psychology helps me deal with people on the job.

"About everyday I have reports to write and English grammar helps me with them," he added.

The "urge to do a better job" and his interest in the professional wildlife training programs he had taken with the Wildlife Resources Commission helped him make his decision to return to school for a police science degree.

"We have training programs we return to every year," said Crawley, "some men go more than others and I guess I was one who went more then I really had to." In January, 1976, he received an Advanced Certificate of Training from the State for completing over 180 hours of classroom instruction excluding time spent on the police science degree.

Crawley's professional courses such as First Aid, Criminal Investigation, Law and Firearms and Safety were evaluated by Bladen Technical Institute and he was given 21 quarter hours credit toward a police science degree.

From that time, Crawley began attending night classes at Bladen Technical Instittute.

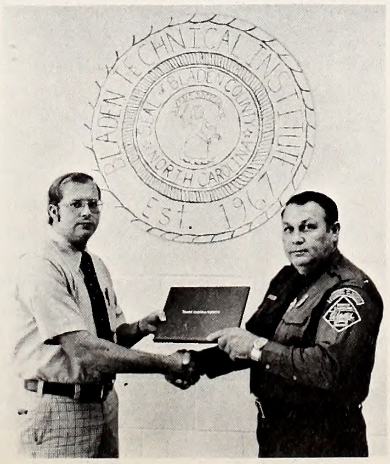
"I got awful tired of going to class night after night," said Crawley, "but I started it so I decided I was going to finish it. I never thought about quitting."

He completed the remaining 75 quarter hours toward a degree in August, attending classes year around and financing his education by himself.

Bladen Technical Institute's Dean of Instruction Jimmy Gaylord feels Crawley's graduation is a landmark in the school's police science program.

"William Crawley is a man who has succeeded at a personal goal. As a result of his ambition and his willingness to work he has become the first graduate of the Bladen Tech Police Science Program. I hope this will pave the way for other law enforcement officers in our area."

Bill Crawley didn't have anything to prove when he went back to school, he just wanted to satisfy a personal goal and "do a better job."



Patrolling the waters of White Lake is part of Bill Crawley's job as Wildlife Enforcement Officer III. Jimmy Gaylord, Dean of Instruction for Bladen Technical Institute, presents Crawley with the certificate of Associate in Applied Science Degree. Crawley, stationed in Bladen County, is the first career officer to receive a Police Science Degree from the Technical Institute.

Spring is Jig Time

by Dwight L. Peterson
Clinton
Photos by the Author

AFTER careful searching I had found mixed schools of black crappie and yellow perch in an area about the size of a pickup truck. Earlier searching with its hang-ups and other difficulties had lowered the number of small minnows in my bucket to a few over a dozen. The rod bent on almost every cast and soon I had a nice string of six crappie and perch. A couple had been released. Now what? My minnow bucket was empty.

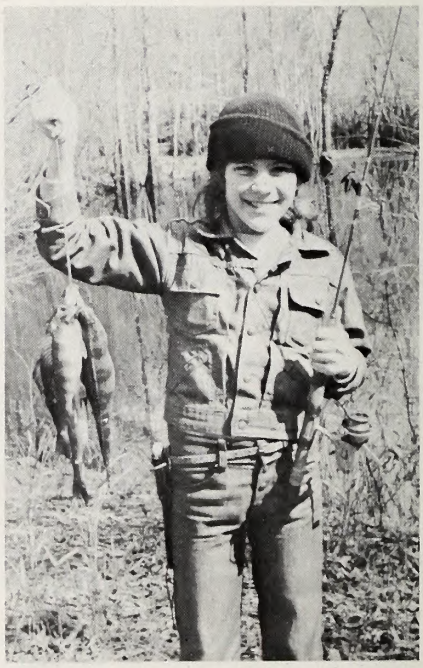
Picking up my ultra-light rod and reel, I began offering small spinner-type lures. Nothing. I then switched to small plugs imitating minnows. Not even a bump. I suppose it was a matter of saving the best for last: I began offering the jigs. My hopes were high when I flipped out the first lead head yellow marabou. My hopes gradually fluttered downward when I hooked only one crappie in 20 minutes and this included going through a hair-pulling variety of colors. I was, needless to say, disappointed. The small solid yellow and solid white had seldom ever failed once I was into crappie. It was just one of those moments.

It was my thoughts that the feeding spree might be over when I picked up another jig from my tackle box. It was a jig I had dreamed up a few nights before while confronting my empty tyer's vise, thinking fish. I tied it on.

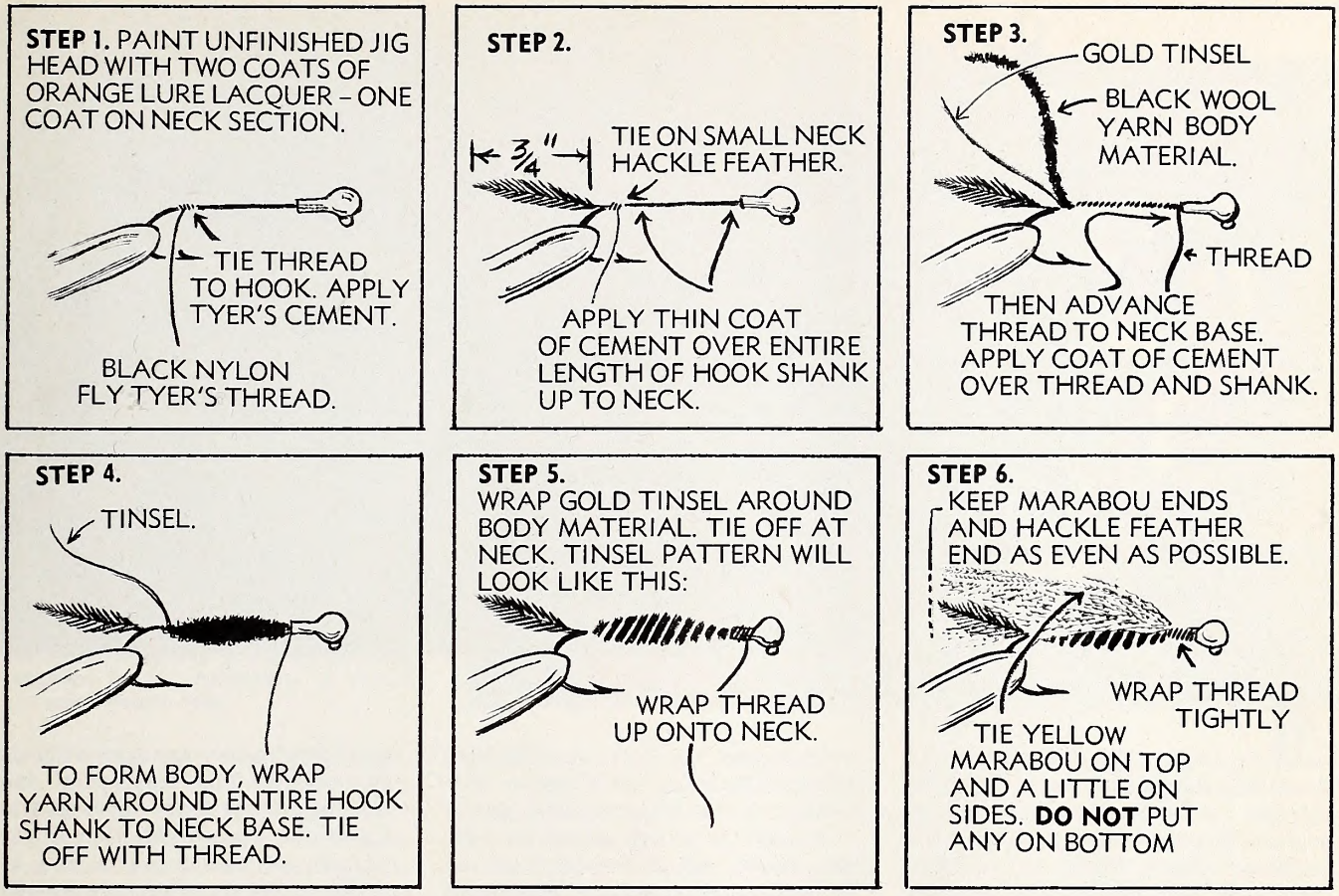
On the second cast I felt the familiar peck at the jig and set the hook into a nice crappie. The next cast was a blank; the next a perch. The action continued until I was completely sold on this pattern. To further satisfy myself, I went back to the other jig colors and patterns with only one crappie on the solid yellow. As far as I was concerned, this new jig had proven itself. And it has many times since.

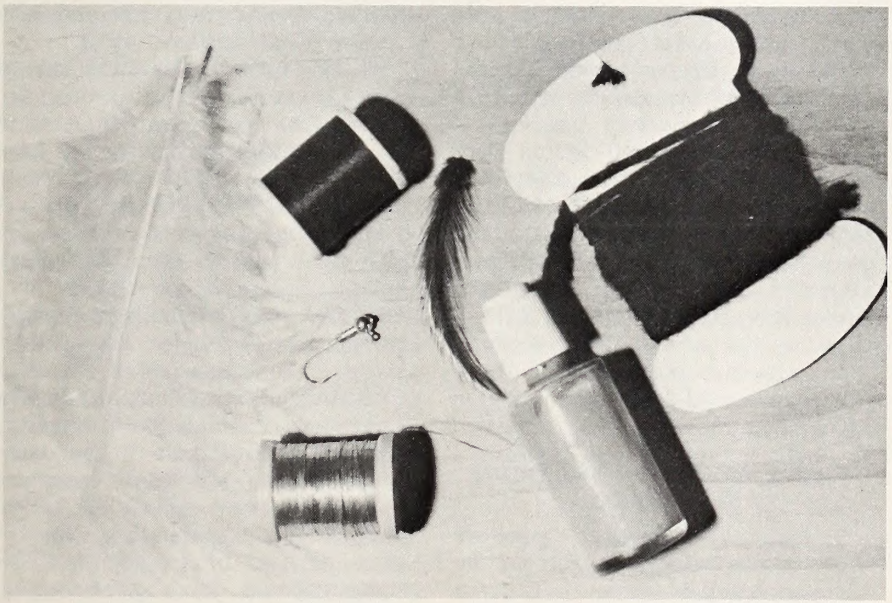
If you enjoy making some of your own lures, I'm sure you will find pleasure in making and reaping the harvest of this jig. Also, I think you will find it deserves a definite, usable place in your tackle box. I'm not saying it will be the only jig you will need, but it will add a producing jig to your selection. You may be way ahead of me with the jig pattern, but so far, I haven't seen it in circulation.

Other than the basic tyer's tools such as vise, scissors, bobbin and possible other equipment, you will need the following materials; yellow marabou feathers (white can also be used on some jigs to offer a change of color with the same pattern), black hackle feather (small neck hackle), black wool yarn body material, gold tinsel thread (round, but flat can be used if narrow), black nylon tying thread (about size D), orange lure lacquer, fly tying cement, and unfinished jigs (lead head and collar molded onto hook but otherwise incomplete). I have found the round-headed jig the best.

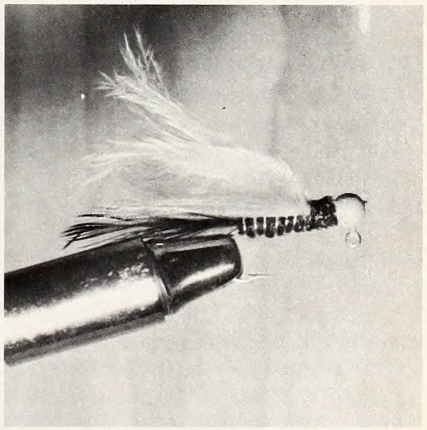


The small 1/32 ounce jig is my favorite size. Next would be the 1/16 ounce. In other words, I prefer small jigs. Thinking in terms of sinking ability, the little 1/32 ounce drops well in water down to about ten feet. Although I like single jigs, two can be used, that is, if you desire quicker sinking of the jig in small sizes. For example, two 1/32 ounce jigs can be tied on 12 to 15 inches apart and fished in





Using the materials shown at left, and the step by step drawings above, you should be able to come up with an effective jig like that shown below. Laurie, the author's daughter, (opposite page) displays some yellow perch taken on the yellow marabou jig.



the same manner as the single. Your fishing results may differ from mine and you may find greater success with the doubles. But it has been my experience that I will catch as many or more yellow perch, black crappie and bream (in that order) with the single jig, plus an occasional largemouth bass. This is especially true with the 1/16 ounce jig.

When fishing this jig, I have found the grasshopper type retrieve the best producer. Cast, let jig settle, watch for a take on the settle, move rod tip up about 24 inches to raise jig off bottom, drop rod tip, reel slack line, let jig settle, count 1,2,3, then repeat. When the jig has reached the boat, jig a little under the boat before reeling in. Strike at the slightest tap at the jig. If the jig does not produce with the present speed of retrieve, change the retrieve pace to faster or slower. You may like some of your favorite retrieves better. Try them.

One last word concerning construction of the jig. Do not overdo the amount of marabou used. Too little is better than too much. The jig should have a streaming, breathing action when moved up and down through the water. It should not appear bulky.

Saga of the Undammed

The Story of the New River

by Rip Collins
Boone
Photos by the Author

MY 12-year-old daughter and canoeing companion used the draw stroke to bring the bow of the canoe expertly away from the boulder which stared at us from the other side of the little chute. I completed the maneuver with a short sweep from the stern. We glided by the boulder without scraping, just in time to see a big turtle plunk into the water.

Turtles are not as common here on the New River as they are on the more languid streams farther east. Piedmont and Coastal Plains rivers are not as cold and clear as is this mountain stream. Neither are they as likely to be as free from pollution, sedimentation and impoundments.

The New River is a delight to float as it winds its way through some of the prettiest pastoral country in eastern America. This river, which rises from springs on a golf course at Blowing Rock, meanders northward into Virginia. Its waters feed into the Ohio, the Mississippi and eventually into the Gulf of Mexico. There has been considerable excitement that this river, curiously named the NEW, is the oldest river in this hemisphere.

Because of its great age, it has a surprisingly gentle drop for a river in a mountain setting. In part that gentleness has been its salvation. Until a few years ago, engineers did not deem it an economical stream to try to harness for hydro-electric power.

Two years before the twelve-year-old canoeist was born, Appalachian Power Company, a Virginia subsidiary of America's largest power company, initiated plans to dam the river. All the years of my daughter's life, many of which she has drifted the river with me, conservationists have been locked in a struggle to preserve this ancient and beautiful stream. By mid-1976 the long controversy reached a climax in the United States Congress. On September 11, 1976, in a ceremony in the White House Rose Garden, President Ford signed the New River legislation into law putting a 26.5 mile segment of the river under the protection of the National Wild and Scenic River System. This was a hurrah day for those who had fought the long and bitter struggle.

Victory for Present and Future Generations

Among those happy strugglers were some farmers in this valley whose families have cultivated these lands for generations. A few of these people are tilling land granted to their ancestors for service in the American Revolution. This is a place where the sound of the dulcimer and fiddle and old mountain ballards are heard—where the juice of sorghum is still squeezed and boiled into molasses and quilts are still sewn by hand.

The unmeasured burden of the long battle is more than a decade of indecision that has been endured by those people whose homes and livelihoods constitute a cherished heritage. For years these families have lived under a cloud. They have not known whether it was wise to sell and move or stay and make needed improvement. Thoughts of new homes and businesses have been curtailed.

Some of their neighbors sold to the power company years ago. Those grounds are now infested by weeds. Fences and farmsteads have been allowed to fall into disrepair. Some of the local citizens had welcomed the prospects of new employment and anticipated recreational opportunity which they thought would accompany the proposed power project. These folks have been more than a little chagrined by the "outsiders" who have come from long distances to propose alternatives to the dams. More than a few have been outspoken in their opposition to the Scenic River designation. For the most part, all of the people of the valley would have preferred to have been left alone without either dam or scenic river. Most see the governmental regulation which will accompany the scenic designation as only the lesser of the two evils from which they were forced to choose.

But once the battle was enjoined, the anti-dam forces decided upon the Scenic River designation as the most feasible defense against the impoundment of the New's free-flowing waters. In the excitement of the controversy, some persons

The New River is many things to many people. For some, this wild, winding stream is a study area for geologic features; for others, it means canoeing solitude; to the fisherman, it means big smallmouth bass.

had no clear-cut notion as to what the designation would mean. Those who favored the Blue Ridge Power project felt that using the designation at all was an improper application of the spirit and purpose of the law. In retrospect, some proponents who have worked hard for the Scenic New River never completely understood the potential and implications for the free-flowing stream.

Still Some Uncertainties

Although it is protected now by the federal law, it is still the State which must secure and manage the scenic "easements" which are required by the act. The decision to ask for the designation from the Virginia line up the South Fork of the New to Dog Creek is a bare one and a half miles beyond the minimum of 25 miles which the Department of Interior required for inclusion in the national registry. This was expedient from a political point of view, but the sad fact is that the lower section of the river is not going to be scenic if something is not done to protect the upper reaches of the stream. The original study by the State recommended Scenic River status for the South Fork from the state line all the way to Boone, some 90 miles total in distance.

Not quite a third of that proposal will be protected under the bill signed into law by President Ford. In the protected segment, state officials project a recreational area which will afford two days of canoeing, three days of backpacking, and about one day each for horseback riding or cycling.

Recreational facility development includes the proposal for two primary activity areas which would include from 150 to 300 acres of land. In conjunction with this, a trail is proposed to the top of a mountain locally known as "The Peak."

The entire 26-mile corridor along the river will be protected against land uses or development which would be contrary to the natural beauty of the area. Areas prone to flood or areas with particular natural beauty will have the highest priority for preservation.

The State proposes to purchase scenic easements from owners. This means in essence that an owner will give up certain rights to the use of his property for certain remuneration similar to a lease to the State. The value of the easement will depend upon the amount and value of rights sold or donated by the owner.

Essentially a scenic easement is for the purpose of acquiring those rights for use of property that would detract from its scenic value. This means that the owner would give up such rights as construction of buildings or cutting timber from the land within the easement. Acquisition of such easements will require detailed investigation and specific terms must be spelled out between the owner and the state.

The boundary of the scenic easements will vary in width from the riverbank according to the topography and the cover. This is in essence a visual corridor established as viewed from the river. Thus where the river valley is broad, the vegetation determines the river user's perception of the corridor. Where the banks are steep, the land area subject to control would usually reach to the top of the steep embankment.

Some land will be purchased outright either by the State or by local governmental agencies. Under these provisions, it will not be necessary for the state to maintain all controls over the river and other local units may be involved in sharing the control and management. For instance, zoning is one method of local governmental control which might be used. It is likely that a Scenic River Commission with representatives with local interest will be formed to oversee the development and management of the river.

River Access Important

One of the concerns expressed by local landowners at preliminary hearings was the potenital problems of the public crossing private property in order to gain access to the designated scenic corridor. For the most part, the state proposes to develop a plan for access including ingress and egress and the rights of private owners would not be violated by those canoeists, boaters, fishermen, hikers, backpackers

or cyclists whom the Department of Natural and Economic Resources anticipate will be using the scenic river and the designated corridors.

Tying the prospects of recreation to the matter of access, the State's preliminary plan would anticipate the purchase of somewhere between 500 and 1000 acres in fee simple. One of the problems of supervision will be to help guarantee the sanctity of private property and provide some type of patrolling which would deter potential trespassing. In the final analysis, the control and management would be the responsibility of the Department of Natural and Economic Resources. The State Purchase and Contract Division of the Department of Administration would negotiate the easements and the purchase of any land that is bought in fee simple.

The idea of a scenic easement is not new to this part of the Blue Ridge Mountains. The magnificent Blue Ridge Parkway was established with similar scenic designations. Although most people seem to think this plan worked well and the Blue Ridge Parkway is a Park of unparalleled beauty for the motoring public, not all of the local people are happy with the Parkway. I talked recently with an "old-timer" who declared that he did not know what good the parkway was because you could not even drive a truck on it.

How Shall The River Be Used?

There will be a number of persons who will feel that the Scenic River has no use because it has no utility. There will be some who may feel that the need for power was more urgent than the need for preservation of the river, and there will certainly be some people who resent being told how they can use "their property."

Deeds to the property along the river are held by some of the best people you would meet anywhere. Universally these good folk have been kind and generous in extending access to the river and permitting the use of their privately held land.

And yet these good people, like many of the rest of us, still see land and nature as something to be conquered and exploited. They, like many of us, still retain the belief that a deed confers ownership rather than stewardship.

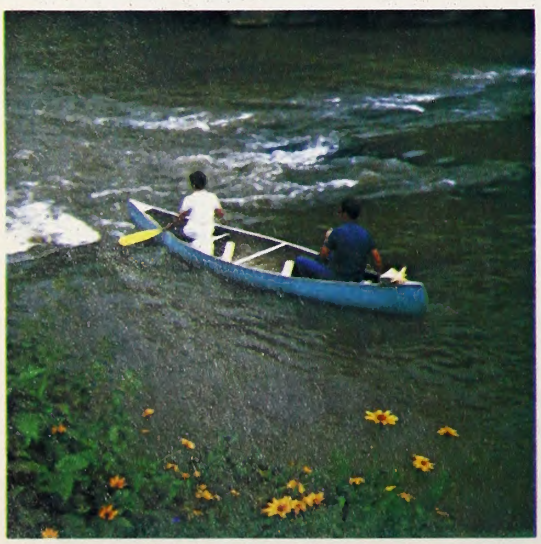
When you talk individually with these good people, you learn that most of them truly love the soil. Ironically, at the same time, many are sending their soil pell-mell down the river. Many, indeed, assume that the river has no function except to carry off trash and sewage and to turn turbines. At the same time, it must be said that those who oppose protection of the river do not do it viciously, but mindlessly.

Unlike many of us, they have never really savored the joys of drifting a stream as beautiful as the New. No matter how many times a person has been boating on a lake, he will find that exploring a river is a completely different experience. On a mountain river it is not just the way the scenery changes so quickly, or the way the mountains seem to come out at you, it is the feeling that you get flowing with the stream . . . traveling in a completely free and natural way without the noise, smell and push of the gasoline engine.

Not many streams are left where a man can have this experience. When our children reach maturity, such rivers may have gone the way of the passenger pigeon. That is the reason why the Scenic River Designation is important, not that it had the negative effect of defeating the proposal for the power dams.

Future More Certain

My twelve-year old and I are grateful for the years of joy which we have experienced together drifting the free-flowing waters of the beautiful New. We are gratified that the new designation will protect the river. There is a lot more to see than turtles on this pristine stream. Along the banks of the river peacefully grazing cattle are sometimes joined by deer. Occasionally we have seen those graceful wild animals cautiously drinking at the water's edge. Sometimes as we have glided by, raccoons have fished undisturbed from the rocks. We have been joined at times by a flotilla of ducklings and watched in sympathy as their frightened mother put on a broken-wing act to decoy us away from her brood. From these waters we have taken trout and smallmouth bass. Most of all, we have taken the inspiration of its beauty and the musical sound of its rhythmic current. There is a harmony about the river which restores the body and soul. This river deserves its "scenic" designation. We hope that it will become much more than a designation. We see for it an equal partnership with the Appalachian Trail and the Blue Ridge Parkway giving this part of the country a trio of trailways unique in the nation.



The New River is a stream for all seasons, but late spring and fall are perhaps its two most colorful and enjoyable times of the year. A canoe or other stable paddle craft makes the ideal way to see and be a part of the River. Long may it flow freely for all to enjoy.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

N. C. Botanical Gardens

Most of the winter activities of the Botanical Gardens are well underway, but you may wish to write for information on courses, workshops, lectures, etc. The address is: N. C. Botanical Gardens, UNC-CH, Totten Center 457-A, Chapel Hill, N. C. 27514.

National Hunting and Fishing Day

If you want to get a jump on this observation to be held next fall, send $5.00 to National Hunting and Fishing Day, 1075 Post Road, Riverside, Conn. 06878 and ask for the "Early-Bird Organizational Package."

Museum of Natural History Doings

Those interested in natural history and things about nature in general, will want to request that copies of the Museum's "Calendar" be sent to them. There are field trips (many from the Hampton Mariner's Museum at Beaufort, too), lectures and exhibits scheduled for each month. Write to: State Museum of Natural History, PO Box 27647, Raleigh, N. C. 27611, to be put on the mailing list.

Hunting Seasons About Over

The last day of this month will mark the close of those hunting seasons still open in North Carolina. The exceptions are crows (second half of the season is May 2-July 2) and wild turkeys (bearded turkeys only) next April and May.

Spring Just Around the Corner

Another quick reminder to have your new '77 boat certificate of number before the first launch, and also a current fishing license (or combination license) if you're thinking about wetting a line. Current fishing regulations are available where you buy your fishing and hunting licenses. Check all your boat's safety equipment, too.

The Versatile Violet

by Ruth M. Noonan
Photographs by Ed Burroughs and
Bill Noonan

THE Common Violet (*Viola papilionaceae*) has no reason to be shy or modest when it comes to taking its place among the edible plants of Spring! Its blossoms, not blue at all, but violet—naturally, may be used to produce delicacies that are a delight to the eye as well as to the palate. And the heart-shaped lush green leaves of this plant can be found and used throughout the year, but they are especially tender and flavorful in the Spring.

Best of all, this plant is widely distributed throughout our state, is familiar and accessible to all of us. It can be found growing in abundance in lawns, woods, roadsides and meadows.

Before we go any further into the details of gathering, preparing, and eating this plant—or any other—we need to become familiar with the following rules for edible plant enjoyment::

Gathering

Gather only where you KNOW foraging and picking are permitted. Gather only that which is COMPLETELY AND THOROUGHLY KNOWN BY YOU to be edible and at the proper stage of development. Gather only what is common and plentiful and what you will use. Remember to leave some for wildlife and for propagation; whenever possible take only part of each plant. Disturb the area where you are gathering as little as possible.

Preparation

Wash thoroughly and according to source; for example, the plant might be growing in or

Most of us know the soft-colored woods violet only as a wild flower; but those "in the know," enjoy it as a delicious and colorful addition to salads and other foods. Here, the violet blossoms are prepared for later use in some of the recipes described in the article.

near a polluted stream or pond, or in an area where pesticides or herbicides have been used. Use only fresh plant material in good condition, and discard immediately those parts that are not edible.

Cooking and Eating

When cooking is required use enamel or stainless steel pots if possible—aluminum may cause chemical change and loss of vitamins. Cook greens in very little water and change the water as often as needed for desired results. Wild plants are rich in vitamins and minerals which won't all wash out. Serve the liquid with the greens and save any that is left over to add to soups and gravies. Eat sparingly of any new-to-you wild food. Do not hestitate to improve and create your own recipes once you know *all* about the plant's edibility.

And now for some recipes! Let's begin with the violet blossoms which we will remove from their stems. These may be used without further preparation as a colorful and delicious addition to either green or molded salads. Crystallized violet blossoms lend a festive touch as a garnish for cakes and other desserts.

Crystallized Violet Blossoms—Beat egg white until foamy and cover blossoms well. This can be done most easily by using your thumb and forefinger to spread the egg white evenly on front and back of each petal. Sprinkle sugar over blossoms generously and place on brown paper on a cookie sheet. Place in a 200-250 degree oven for about 15 minutes or until thoroughly dry. These can be stored in tightly sealed jars.

An infusion made from the violet blossoms is the basis for a number of recipes and is very simple to make:

Violet Infusion—Fill any size glass jar with violet blossoms loosely packed, and cover with boiling water; put lid on jar and let stand for 24 hours. Next day the blossoms will be white and the water will be blue. Discard the blossoms and store the infusion until ready to use.

Violet Syrup—To each cup of violet infusion add two cups of sugar and the juice of half a lemon. Bring to a boil stirring often, and boil for 6 to 8 minutes. This may be stored in glass jars and used on waffles, pancakes, and the like, or try it on ice cream for a "wild" sundae. Be prepared for a pleasant surprise when you add the lemon juice—the original violet color is restored!

Violet Jello—Use violet infusion as "fruit juice" and "water" and follow the directions on a package of unflavored gelatin. To each cup of violet infusion add the juice of half a lemon and sugar to taste. Violet blossoms vary in sweetness; begin with very little sugar. After the jello thickens slightly you may add raisins, nuts, or chopped raw fruits or vegetables. The beautiful color and delicate taste of this jello are beyond description.

It is time now to talk about our violet leaves. First of all it is of interest to know that they are a rich source of Vitamin C—more so than any of our cultivated vegetables, and they also contain significant amounts of Vitamin A.

Gather fresh bright green leaves, wash carefully, and with no further preparation these may be used as a salad green, alone, or in combination with other ingredients in a tossed salad.

Violet leaves may also be cooked and served like any leafy green, or used in a favorite vegetable casserole recipe.

Violet Greens—Remove most of the stem and put leaves in a pot with just enough water to keep them from scorching. Bring to a boil, pour off this first water, then add fresh water and boil until tender. Season to taste and serve with the liquid they were cooked in. Eat in moderate amounts since, like any green, violet leaves may have a mild laxative effect.

Violet Leaf Casserole—Prepare enough violet leaves to provide approximately one and one-half cups of cooked leaves. Combine these with the following ingredients after mixing: 1 beaten egg; 1 can of mushroom soup; ½ cup of mayonnaise; ½ cup grated cheddar cheese; 1 tablespoon minced onion; seasonings to taste. Place in a casserole dish and top with ½ cup grated cheddar cheese and seasoned bread or cracker crumbs. Bake 20 minutes at 400 degrees.

"What do violets taste like"? you may ask; and the answer is "They taste like violets!" They have their own unique and delicate flavor as do all edible wild plants. And the violet is only one of many "incredibles" that we may gather and enjoy. Not all are as familiar, plentiful, harmless, and versatile as the Common Blue Violet, so it is of utmost importance to follow the rules we set forth at the beginning of this article.

How can you learn about edible wild plants? There are, of course, many reference books available at your library or your book store. The "Stalking" series by the late Euell Gibbons is the most complete and informative source I've found. Since correct plant identification is a must you should also use field guides to help you identify the herbaceous and woody plants under consideration.

The very best way to learn is from someone who knows, and here in North Carolina we have a growing number of "experts." There is, for instance, a Piedmont-based organization which publishes a schedule of meetings and field trips. For further information write: North Carolina Wild Foods Enthusiasts, 4842D Tower Rd., Greensboro, N. C. 27410.

And there is an Annual Wild Foods Weekend sponsored by Rockingham County Naturalist Club and Rockingham Community College at Betsy-Jeff Penn 4-H Center near Reidsville which provides an opportunity to identify, gather, prepare, and eat edible plants and other wild foods under tutelage of experts. For further details about this year's event scheduled for April 15-17 watch "Resource-O-Gram" in this magazine or write Wild Foods, Rockingham Community College, Wentworth, N. C. 27375.

A GOOD IDEA

Conservation Library

by Sam Poole
Wildlife Biologist
John Wilkins
District Conservationist, S.C.S.

IN the spring of 1974 an In-service Science and Conservation Workshop, sponsored by the Lenoir Soil and Water Conservation District, for the teachers of Lenoir County Schools was held at Lenoir Community College. During the workshop, based on the discovered needs of teachers for supplementary soil, water, plant, widlife and resource conservation materials to be used in their classrooms, the idea of a conservation library was discussed. From this inception, the Lenoir Soil and Water Conservation District explored the library concept and found it highly feasible. Work was immediately begun to bring the idea to reality.

The Lenoir Soil and Water Conservation District Board of Supervisors with the help of local school leaders, church groups, civic groups, and local sportsmen who became interested in the promotion of wildlife conservation and management, and other citizens interested in the total resource conservation development began collecting materials and technical data for the library, which has been a continuous process.

The North Lenoir Future Farmers of America at North Lenoir High School and the Lenoir Soil and Water Conservation District's Jr. Board of Supervisors have provided youth leadership and needed advice, as well as the construction of various physical items such as, bulletin boards and wildlife display boards.

Examples of materials contained in the library are color slides, pictures, charts, graphs, maps, aerial photography, illustrated notebooks, plastic mounts of wildlife plants, wildlife display board, county soil surveys, wildlife bulletins, soil and water bulletins, wildlife and conservation reference books, posters, wildlife and soil comic books, mineral samples, soil profiles and wood samples.

The Conservation Library is located adjacent to the Soil Conservation Service Office, Room 202, Agricultural Service Center, East King St., Kinston, N. C. This is a storehouse of materials ready for use by the public.

A better understanding of the use and importance of our natural resources will result from the increased use of this library.

The District Secretary of the Lenoir Soil and Water Conservation District serves as librarian. All foregoing listed materials and others are available upon request by loan or gift. Materials loaned are checked out by a card file system. The library is being used by private citizens, students, and teachers from elementary, high school, and college levels, scout groups, garden clubs, civic groups and wildlife clubs.

The basic financing of the library is provided by the Lenoir Soil and Water Conservation District. Each year the District uses part of its budget to purchase additional materials. You can have a part in the continued expansion and maintenance of this facility by contributing funds on materials related to natural resources management.

Please send items or inquiries to Lenoir Soil and Water Conservation, P.O. Box 457, Kinston, N. C. 28501.

After two years in operation, the Lenoir Soil and Water Conservation District believes that the Conservation Library is a good tool to be used in helping to meet the wildlife and conservation educational needs of a county. The District encourages other counties to investigate this concept for its county.

Grif Reese, Eagle Scout, of the Bethel Christian Academy, examines a catalog of preserved plant materials, a part of the Conservation Library. Standing are (left to right) Candy Gregg, Secretary of the Lenoir Soil and Water Conservation District; John Wilkins, District Conservationist, S. C. S.; and Sam Poole, Wildlife Biologist with the Wildlife Resources Commission.

Stem to Stern

BY ED JENKINS

With the arrival of the first mild days of February and March, interest in fishing is rekindled and fishermen, who have piddled with this and that around the house during the cold winter, can be seen scurrying around picking up new fishing lures and gadgets they feel are certain to wake up that ol' moss-backed bass from his winter inactivity. Items that were haphazardly left lying about after that last fishing trip suddenly become objects of frantic searches. The renewal form for the boat's certificate of number may be found in a pile of unpaid Christmas bills, while the secret compartment in a billfold is a favorite hiding place for that elusive fishing license.

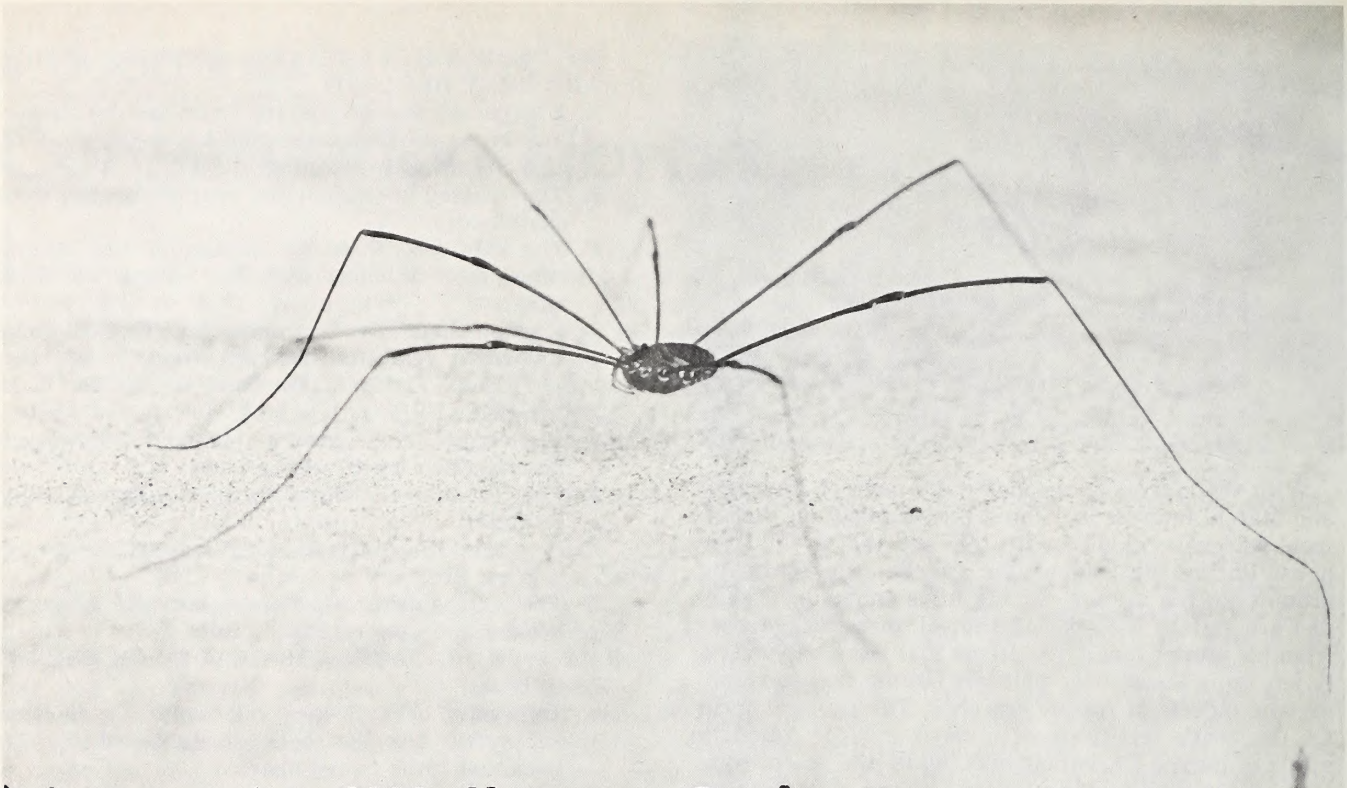
Only a dedicated few will find themselves fully prepared for that first fishing trip this year, and it is with this in mind that we offer this short quiz to help us determine just how ready we'll be when that attack of spring fishing fever hits.

Circle the letter before the statement which best describes your situation.

1. MY FISHING LICENSE:
   A. Is valid and is safely tucked in my wallet;
   B. Is probably somewhere in my tackle box or in the boat;
   C. Is stuck to the back of a package of jelly worms;
   D. Reads "Valid 1975."
2. MY OUTBOARD MOTOR WILL PERFORM WELL THIS YEAR BECAUSE:
   A. I winterized it before I stored it;
   B. I stored it without any service, but it usually will start and run;
   C. My marine dealer will fix it after I can't get it to run;
   D. The thief who stole it from my boat probably "stored" it well.
3. BEFORE EVERY BOATING SEASON MY BOAT TRAILER IS CHECKED TO SEE:
   A. If tires are properly inflated, lights are in working order, wheel bearings properly greased, and winch and rollers are lubricated;
   B. If the new license plate has been put on the trailer;
   C. If the tires are flat;
   D. If the grass under the trailer has been killed by the shade.
4. MY MOTORBOAT REGISTRATION CERTIFICATE OF NUMBER:
   A. Has been renewed for the coming year;
   B. Has not been renewed, but is around here someplace;
   C. Was accidentally thrown in the fireplace with some old Christmas cards;
   D. What is a Certificate of Number?
5. MY PERSONAL FLOTATION DEVICES (PFD's) ARE OKAY BECAUSE:
   A. I inspected the devices for wear and by squeezing them to make certain the kapok-filled plastic bags inside were airtight;
   B. They passed inspection last year when they were examined;
   C. The kids used them for swimming aids several times last summer, and they supported them okay;
   D. I sat on them at every high school football game I saw last year, and they felt fine.
6. MY FIRE EXTINGUSHER CAN BE USED THIS YEAR BECAUSE:
   A. The charge is still good and the wire showing it has not been used is still intact;
   B. The last time I found it in the boat it was okay, I think;
   C. It worked fine last year when I used it to put out a grass fire;
   D. The extinguisher is empty, but the gauge is broken and still registers "full."
7. MY FISHING TACKLE IS READY FOR USE BECAUSE:
   A. Reels have been cleaned, oiled and new line put on; tackle box has been straightened up and hooks on lures honed sharp;
   B. It is still sitting in the corner of the garage where I left it last year;
   C. I left everything in the boat last year including the dried worms on the hooks and the lure snarled in the landing net;
   D. I bought all new equipment, because my old fishing tackle is on the bottom of the pond where I flipped my boat last year.
8. I FEEL PREPARED FOR THE BOATING SEASON BECAUSE:
   A. I took a free boating course or did some home study by reading magazines and books on boating during the winter;
   B. I looked over my boat and believe I have all the required safety equipment aboard;
   C. I took out more liability insurance this year in case I am involved in a boating accident or am sued;
   D. I have a case of beer set aside for the first trip.

SCORING: All "A's" indicate a person who is well prepared for the boating season. One or two "B's" are okay, but show those areas in need of attention. "C's" indicate trouble ahead. And hopefully, those who got "D's" will decide not to go fishing this spring or we'll all be in trouble!

A few warm days is all it takes to get fishermen out on the water again. We hope this month's column has helped you prepare for the first outing.



Nature's Walking Stilt

by Rowland M. Shelley
Curator of Invertebrates
N.C. State Museum of Natural History

IN the fields of England at harvest time, large numbers of long-legged invertebrates reach maturity and are extremely common. These animals are known as "harvestmen" or "harvest-spiders," since they superficially resemble spiders, and in the United States, they are often called "daddy long-legs" and, in northern New York, "grandfather graybeards." Scientifically, these invertebrates are referred to as phalangids or opilionids, and they belong to a group of animals called arachnids, which also includes scorpions, spiders, mites, and ticks. The arachnids, in turn, belong to a group of invertebrates called arthropods, which also includes insects, millipeds, centipedes, crabs, lobsters, and isopods.

It has been written that the study of harvestmen is a study of legs, and these are indeed the animals' most conspicuous feature. In the genus *Leiobunum*, the legs are over six times as long as the body, but some phalangids are small and resemble mites or ticks. In these, the legs are only slightly longer than the body.

The body of a harvestman is comprised of a head, thorax, and abdomen, which are fused together and relatively indistinguishable. The eyes are mounted on a tubercle arising from the dorsal surface of the "head" and are situated adjacent to one another in the midline so that they appear to look sideways in an unblinking stare. The eyes are photoreceptors and cannot form images, although some perception of movement does occur. Depending on the species, the dorsal surface may also be ornamented with other tubercles and low spines, and in the tropical family Gonyleptidae, several large, prominent spines protrude from the caudal end of the body. When harvestmen are walking, the body is carried relatively close to the ground, which may be surprising considering the stilt-like nature of their legs. However, the middle segments of the legs extend high into the air, and the body hangs suspended down between them.

As with all arachnids, harvestmen have four pairs of legs preceded by a pair of leg-like structures called pedipalps. The second pair of legs is usually the longest and, in many ways, the most important. The animals can automize (release) legs as a means of escaping prey and can survive on as few as four legs, provided at least one of the second pair remains. They live with one of the second legs as well as with two, but their behavior is drastically different if both are missing. The second legs appear to be used for tactile and olfactory purposes, and the animals use them much like other invertebrates use antennae, tapping the ground before them as they proceed. Resting harvestmen often wave the second legs about, "testing" the environment, and a thirsty individual has been observed placing its fourth and then second legs in water before moving forward to drink. Harvestmen take good care of their legs and clean them frequently, usually atfer feeding.

Opilionids are mainly nocturnal, carnivorous arthropods and feed on a variety of smaller invertebrates which they catch and imprison with their legs. The body then drops down from above and tears the prey to pieces. The availability of water is especially important to the animals, and they will die in a few days if unable to drink. They require moist environments and are positively hydrotactic—*e. g.*, they move towards moisture. This partially

explains their occasional appearance inside houses, particularly in bathrooms and kitchens. In dry conditions, they will drink for several minutes at a time, and in 1924 in California, several individuals were reported drinking from ink wells. They showed a preference for red ink, but spurned black. Not infrequently, harvestmen may be seen standing over fallen fruit sucking juices from the bruised area.

The enemies of phalangids include a few invertebrates, notably spiders, and small vertebrates, such as frogs and toads. Cannibalism is rare for most species, and they are protected by secretive habits and cryptic coloration. In addition, at least three defense mechanisms are available if they are attacked. The first is the secretion of a fluid from the repugnatorial glands which renders the individual unpalatable and deters certain predators. If this method fails, some species feign death and become rigid, with their legs in unnatural positions.

The final method is the automizing of legs mentioned earlier. The released leg may continue to jerk for an hour or more thus distracting the predator's attention from the departing harvestman. This method must be used sparingly, however, for if both legs of the second pair are released, the animal is doomed.

Mating in opilionids is a random occurrence. Males and females mate when they encounter one another and then continue on their separate ways, mating with other individuals when they are met. No true courtship has been observed, but there are some behavioral differences in the mating patterns. Eggs are deposited in crevices in the soil, under stones, and in other moist places. Some harvestmen lay their eggs in empty snail shells and secrete a protective membrane to seal the opening. In Britain, the eggs are laid in autumn and hatch the next spring; in other areas, however, the young emerge in about 20 days. Depending on the species, the female may guard the eggs until they hatch. Juveniles resemble miniature adults but lack a number of details which are gradually assumed with each succeeding molt. Harvestmen live for no more than one year, with males usually dying before females. The latter die shortly after laying the eggs, but occasionally may survive to produce another clutch.

Harvestmen are innocuous animals and pose no danger to man; they may thus be collected by hand. Poison glands are absent, and the small pincer structures that do exist are much too small and weak to pierce skin. A few South American species can pinch with their hind legs and produce strong, nauseating odors from the repugnatorial glands, but the scent of other species cannot be detected by humans. The repugnatorial secretions seem to have an anesthetizing effect on other phalangids, and when several individuals are together in the same container, they frequently appear lifeless and lie in a tangled mass of legs. When released, however, they quickly recover and act normally.

The opilionid fauna of North Carolina is poorly known. A dozen or more species of *Leiobunum* probably occur here based on published records from other states; due to the cooler temperatures and higher humidity, they would be expected to be more abundant in the western part of the state. None of the small, mite-like species have been reported from North Carolina, but *Caddo agilis*, distinguished by relatively short legs and enormous eyes, has been collected in Macon, Yancey, and Buncombe counties. To my knowledge, no foreign species have been introduced into the state, and our total population is apparently indigenous. Thus, information about the phalangid fauna of North Carolina would greatly enhance our knowledge of the natural history of the State.

THE SECOND ANNUAL NORTH CAROLINA NATURE PHOTOGRAPHY CONTEST

Prizes: Grand Prize, $100; First, Second, and Third Prize in each category, $50, $25, and $15. About 5% of all accepted slides and prints will receive Honorable Mention.

Competition: Photographs depicting plants, animals, and natural scenes of North Carolina are eligible. Judging will be in three categories: 35 mm. color slides, color prints, and black and white prints. All prints must be mounted for exhibit.

Rules: The competition is open to any resident of North Carolina (except employees and associates of the N. C. State Museum). Up to three previously unpublished photographs may be submitted in each category. There is a $1.00 entry fee per photograph. Each entry should have the name and address of the photographer and the title of the picture, if any (use back of prints, margin of mount for slides). Prints should be mounted for exhibit. Entrants who wish materials returned must include a self-addressed, stamped envelope or package label, unless retrieving photos in person. Those wishing to donate their entries to the Museum should so state, and the entry fee will be waived. The Museum will take all reasonable precautions to protect materials from loss or damage, but will assume no responsibility for them. The Museum reserves the right to duplicate pictures for exhibit and publication.

Judging: Photographs will be judged on the basis of subject, composition, and general aesthetic merit. Judging will take place on March 28, 1977, and winners will be notified on April 4, 1977. The decisions of the judges will be final.

Dates: Mail or otherwise deliver entries, carefully packed, with entry fee to David S. Lee, Chairman, Nature Photography Contest, N. C. State Museum of Natural History, P.O. Box 27647, Raleigh, NC 27611. Deadline for receiving entries is March 22, 1977. Winning prints will be on exhibit at the Museum between April 1 and May 15, 1977. Accepted slides will be shown on Sundays, Tuesdays and Thursdays at 2:00 during the exhibit period.

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Late Season Bobs

by Charles M. Rucker

Photos by the Author

I hunted quail as a boy for several years without benefit of a dog. Shots were few and far between . . . . in terms of distance as well as time.

Since I was only 14, my father would have to take me into the country on his way to work. He never seemed to mind driving me so far, so early in the morning.

I felt the full weight of the vest, loaded with heavy red shells when I got out of the car. They waited ready and brass-up in the stitched elastic bands. I took his double-gun out of its case and slammed the back car door.

The eastern horizon was becoming bloody and tired with the promise of another day.

We compared watches so I'd be on time when he returned to take me home. He told me to be at the bridge at six o'clock, and of course to be careful with the gun.

He smiled to me in a proud way, then started the car and pulled back onto the road. The exhaust was white and profuse in the cold morning air as he drove away. I slid a shell in the breech of each barrel. The gun closed tightly and with a firm sound. It was Dad's favorite.

When the distant drone of the engine finally died, it became very quiet and the entire earth seemed to be listening. I felt empty and lonesome. And yet it was wonderful also. I was standing on the threshold of a new day, convinced that I was about to embark on some great adventure.

It was during these early years that I learned the most important lessons of hunting.

The location of the quail could only be guessed, and I pursued them in the most primitive fashion . . . by "walking them up," which is nothing more than walking randomly through the woods and fields until I happened to stumble into a covey.

Needless to say, I got no warning, and the element of surprise was decidedly in favor of the birds. Often I was caught so off-guard that I didn't even get off a shot before they scattered and sailed out of sight. Or I would walk directly to where a single had pitched down, yet it would be nowhere around. Other times, a bird would tumble in a shower of feathers and leaves, yet in no number of repeated circuits around the area could it be found.

If however, I did succeed in killing a quail, and was again successful in finding it, there was a big celebration. I would go back to where the spent shells lay in the leaves. The entire affair was re-enacted, complete with throwing up the gun and sighting down the barrel. Each movement, each step was savored and remembered. Then, a day which yielded two birds was by no means considered failure.

It was through this inadvertence which I learned that even quail follow a tentative schedule. In the early morning and late afternoon they feed. This means that the cut soybean and millet fields hold best chances. At these times of day, the birds take their greatest risk, and often venture quite far out into open fields. If flushed here, a double is no problem for a seasoned shooter.

Late morning and mid-afternoon are transitional periods, and birds are usually located in woods or patches of tight growth such as blackberries.

On either side of noon by an hour is when they are nearly impossible to find. It is also when they are the furthest from the feeding station than at any other time of day. Usually honeysuckle or waist-high kudzu thickets are worth investigating if they are in creek bottoms or deep in the woods. Shooting in this situation is invariably tight and fast. It is here that I would

Woods quail will often head for the worst tangles they can find, making locating singles a bit tricky. An "open" barrel is usually best for fairly close shots under these conditions. Abandoned farms and homesteads (left) generally have some sort of cover that holds quail. Check them out.

often swear that birds would intentionally fly away in direct line with trees to prevent clear shots.

The singles from a covey found in these surroundings will be virtually unascertainable; especially without the services of a long-winded dog. They usually head for swamps, thick cedar stands, or perhaps even cross a river. This is part of the reason why quail shooters take extended breaks or rest at mid-day.

A wide brimmed hat is indispensable. The light from the morning or late day sun is often glare-producing. Also, a quail will sometimes choose to fly toward the sun . . . . another unexpected "trick"—which many of us declare intentional. Either way, it contributes to the uncertainty, challenge, and overall affection that most sportsmen feel for this bird.

If gloves are worn, they must be thin enough to maintain the tactile sense necessary in quick safety and trigger operation. In short, since in this type of hunting speed and resolution are decisive, the eyes and hands must be able to perform well and quickly.

Blisters are the walking-hunter's worst enemy. They can render the strongest and most zealous shooter miserable and ineffective. Boots must fit properly; not loose enough to permit slippage or binding in the heel. Use heavy socks and innersoles to occupy extra boot-space.

As stated, shots came hard and slowly. It was because of this that I try to make the most of every opportunity. The ability to aim quickly, and not hesitating to follow up a miss or cripple with the left barrel often makes all the difference.

When shooting through brush at a fleeting single, I often felt that there was no chance of the shot pattern emerging from the tangles and still being intact enough to be effective. This was wrong. A load of small shot at close range is extremely powerful, and can cut through any cover which you can see through. It took me a long time to believe that, and many times since I have sliced a pine as thick as my wrist, and killed the bird also.

Where do singles go? That was the great enigma which could only be answered with speculation for several seasons. And even today, frequently both the dog and I will see an entire covey of singles disperse with cupped wings among the pines, yet we will emerge on the other side of them without even hearing one rise.

In this situation, I offer only one answer. The birds probably pitched down, but immediately flushed again collectively and "left the country." Where they are to be found now is such a perplexing question, that I usually don't pursue them any further but look for another covey which will cooperate better.

But in general, it pays to remember one rule when looking for singles: that they are trying to escape, so they are probably in rougher and more difficult surroundings than where they were first encountered. This means that if you flush a covey in the field, they are now probably in the woods. If you flush them in the woods, they are now in the kudzu or honeysuckle. Exceptions are numerous, but this is my reasoning . . . if reason has any application to them.

While walking, make frequent stops if there is reason to believe that quail are near. Gamebirds such as woodcock and partridges which depend upon surprise and fast acceleration are invariably nervous creatures. If you keep walking quickly, they may let you go right by them without a flinch. However, if you periodically stop and listen or walk slowly, the bird may decide that it is spotted and should take to the air. At these periodical stops, I have often heard quail running through the weeds, which is their last resort before flying.

The shooter who uses his eyes and ears extensively

has a key advantage. Knowing what to look and listen for is of course important.

"Dusting bowls," or little depressions in the dry soil, are where quail come to "dust," or socialize much like songbirds do at a birdbath. These bowls are usually six to ten inches in diameter, and about one to three inches deep. A few telltale feathers are found around the bowl or in the dust which is contained in the depression. At the base of a stump or beneath a fallen tree is where they are frequently found. This arrangement allows at least one quail to keep vigil while others dust. This minimizes the possibility of a cat or other predator stalking the covey unaware. If the guard-bird flies, they all scatter instantly in a drumming explosion; no questions asked.

Bird droppings, of course, are another positive sign. That of quail differs from all other birds. It is usually black and white—but mostly white, and in the form of round moist pellets. If this is found in a large amount and in one spot, it may indicate where a covey roosted for the night. During the day, quail seldom stay in one place long enough to deposit this matter in quantity.

If your dog points, and you move in for a shot but find only droppings, it is a sure sign that the quail are running and may get up "wild." The unexpected will usually happen in this situation since the dog can no longer be a sure source of information to their location.

Listening is also important. A covey of eight to 15 quail makes considerable noise in dry leaves. The individual steps they take are indiscernible, but rather they sound like a baseball might if you could roll it slowly yet constantly through leaves.

These birds often make quick peeps and chips just before they flush, and sustain it the first few yards in flight. When the experienced quail shooter hears this, he knows that the birds are very close and nervous indeed.

Even though it sounds like a good plan, you should never try and get between quail and where you think they will retreat to. Separating them from the only available cover sets you up for an almost impossible shot. For these birds have no qualms about flying straight at a gunner, growing to unbelievable proportions as they sizzle just over his head and shoulders. Needless to say, this tactic is disconcerting at least, but may also put you in a dangerous position in regard to other hunters. They may not know where you are at that moment.

If you are alone, and are "charged" by a covey, the only choice is to wait until they pass you by. Then turn quickly and attempt a going-away shot as usual. If you don't wait until then to shoot, the pattern would be so tight that the bird would be missed cleanly or totally annihilated.

While overtaking a pointing dog for the flush, don't try and spot the birds on the ground. As long as they remain still before flying (as they usually do), quail are so perfectly camouflaged that not even the best eyes can disclose their location. Instead, look straight ahead. It will be a lot easier to pick one of them out against the sky rather than in leaves.

If the bird you choose "puts a tree" between you and it, quickly take a step to the side. This action may once again open up a clear shot. Very seldom is there enough time to waive a hard shot and take recourse on another.

Reload quickly; especially after a covey flush. Many times quail termed "sleepers" will rise several seconds after the bulk of the group has left. An alert shooter may end the day with an extra bird for this reason.

The success of late season bobwhite hunting isn't measured by "limit kills," but rather by memories of covey rises, staunch points, a difficult shot and much more.

I can remember clearly the first time I ever saw a dog on point. I was 17. My father was invited to bird shoot down in Pender County with one of his old friends. This man inadvertently asked if I should be invited also. Of course I was in earshot and had heard the entire affair. Dad really had no choice. Besides, I was safe with a gun and also fairly efficient on birds. It was settled.

That next Saturday found me on the flat, sandy ground of the Coastal Plain. It was quite different from Guilford County, and I was told that rattlesnakes were commonplace, which added a delicious dimension to the anticipation.

There were boots for the dogs which looked like small golf club covers. I found this amusing, but learned their purpose that evening when I ran barefooted to help unload the car. A sandspur had lodged between my big toe and ball of my foot. All of a sudden, those dog-boots made plenty of sense!

The next morning I was awakened by the barking of dogs. I gained consciousness in a strange room, then remembered; and again the wonderful excitement rushed into me.

The dogs were being given a light meal before the hunt and seemed quite excited.

I quickly dressed and ran to look at them. They danced and raced around inside the pen. There were two black and white pointers and an ugly black German short-haired pointer.

After breakfast, we let them out and they dashed for the cage in the back of the station wagon.

The German short-hair growled at one of the pointers, and I thought of what a fight it would be—involving three dogs in a cage that small. A firm word from their master, and all their differences dissolved.

We drove down a sandy road. There were no hardwoods, only tall pines.

The dogs were lying down in the rear, resting their heads on another's back. But when we stopped, they

I was so absorbed, in fact that I hadn't realized the German short-hair had been missing for several minutes.

I called to Dad and told him. He walked off the road to the left; his friend to the right. I ran back down the road, and then off to the left. There were only pines and sage. Across the road it was no different, yet there was something strange about a great blackberry thicket.

Among its tangles, and partly obscured stood some-immediately rose to their feet, and resumed their restlessness. When released, each one jumped clear of the cage and started off in a different direction.

We walked down the road; Dad and his friend talking of things which happened before I was born.

The pointers were easy to see because of all the white on them. Every few minutes, one of them would streak across the road in front of us, then disappear once again. I was absorbed in watching how the pointers systematically "cut up" ground. And I thought of how much walking they could have saved me during the last few seasons. They knew exactly what they were bred for; criss-crossing through the brush with lightning speed, yet they missed nothing. What a difference dogs made. Until then, I wondered how so many old men got through a day of quail shooting alive . . . . much less wanting to go again.

thing black and grotesquely contorted. Probably just a burnt stump. It didn't move, and didn't remotely resemble a dog.

I walked closer. In amazement, the "stump" resolved itself into a serious German short-hair frozen rigidly.

I called, "Dad, he's over here! Come on!" It seemed like they took forever. Finally, we walked past the porcelain short-hair, so different from the one I had seen in the pen. The three of us were abreast, with me on the right.

Faintly, we heard the chirps of uneasy quail. With the next step, a bomb within the earth seemed to explode, and a feathered piece of its shrapnel flew out my side. The double-gun reflexively leveled at my shoulder, I swung and the trigger collapsed. The little rooster rolled.

The dog had now straightened itself out and was transformed back into the affectionate, curious short-hair that I had known earlier. Its golden eyes now had laughter in them instead of fire.

We hunted the rest of the morning and into the afternoon. I made impossible shots which I will never forget, yet missed others which I could have made back when Dad would drop me off beside the road.

There were plenty of birds. By three o'clock we all had our limits. And for the first time in my life, I had shot enough quail to call it a day before sundown.

• GALLINULE from page 7

exposed that some authorities claim that incubation is partially carried out by sunlight. "Dummy nests," or partially finished nests surround the active one holding the eggs. The function of these half-completed nests is not known, but it is common as a behavioral trait in nesting purple gallinules.

Predation losses were heavy, probably due to the exposed nature of the nest. Water snakes, crows and raccoons were particularly prevalent in the study area and probably played a role in the low nest success of the species. All active nests were destroyed by predation before fledging. This total predation loss was based on the absence of hatchlings and disappearance of eggs from the four gallinule nests monitored. The banded (*Natrix sipedon fasciata*) and the brown (*Natrix taxispilota*) water snakes were considered to be the major culprits.

The significance of these data on the purple gallinule is that of possible range extension prompted by creation of suitable nesting habitat. Most sources consider the species a rare but regular summer resident of the wetlands of the southeastern United States. In Florida it is an inhabitant of cypress swampland and throughout South Carolina and southern North Carolina it is found in old rice field plantations. Although plant foods and insects are abundant at White Oak Impoundment, the habitat represents an environmental variation from its typical Floridian environment. Exactly what requirements are necessary for the species to successfully reproduce are unknown but would represent a worthwhile project for future research.

KNOW YOUR ENFORCEMENT OFFICER

Michael P. DeBruhl

Wildlife Enforcement Officer Michael P. DeBruhl was born in Mars Hill, N. C., January 11, 1948. He is the son of Mr. and Mrs. Porter F. DeBruhl of Mars Hill. He is a graduate of Mars Hill High School and Blanton's Business College in Asheville. He served in the U. S. Army's 1st. Infantry Division from 1969-1970, including a tour in Vietnam.

Mr. DeBruhl was first employed as Wildlife Trainee in September 1973, stationed in Robbinsville. On May 1, 1974, he transferred to Jonesville as a Wildlife Officer, where he still resides on Gregory Drive. Enforcement Officer DeBruhl has attended Wildlife Recruit School and Basic In-Service Training School. He is a member of the Southeastern Association of Game & Fish Commissioners (Law Enforcement Section), and of the District Seven Water Safety Team.

He is married to the former Kay Thomas, and they have one son, Brian Scott, age 3½.

ENFORCEMENT RECORD FOR NOVEMBER, 1976

HUNTING AND FISHING

Persons Checked	34,683
Total Prosecutions	919
Total Convictions	827
Total Fines Collected	$15,738.00
Total Costs Collected	$18,128.50

BOATING

Boats Checked	372
Total Prosecutions	194
Total Convictions	168
Total Fines Collected	$ 290.00
Total Costs Collected	$4,087.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

Female Cardinal

Photo by Micou M. Browne

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White-footed Mouse by Jack Dermid

Is Spring Here Yet?

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Wildlife

IN NORTH CAROLINA

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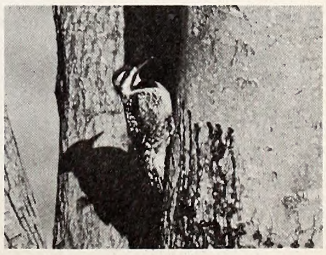
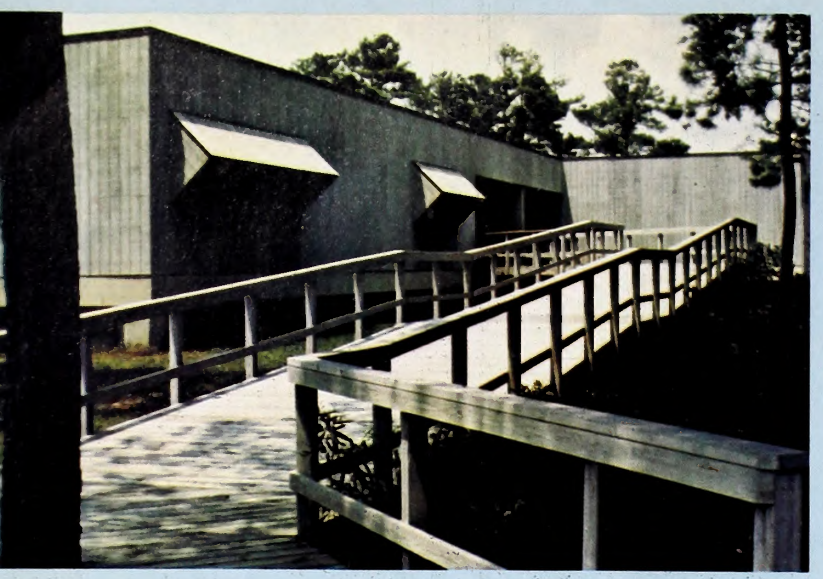
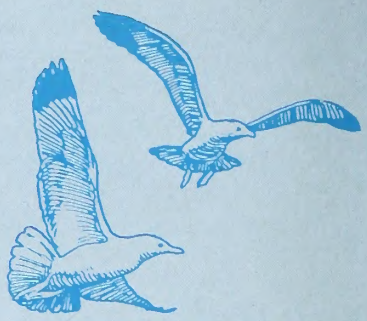


The yellow-bellied sapsucker enjoys the sap from a silver maple in the March sunshine. By mid spring, these birds will be heading for the mountains and won't return to the eastern and central part of our State until September. Photo by Ted Dossett.



Marine Resources Centers

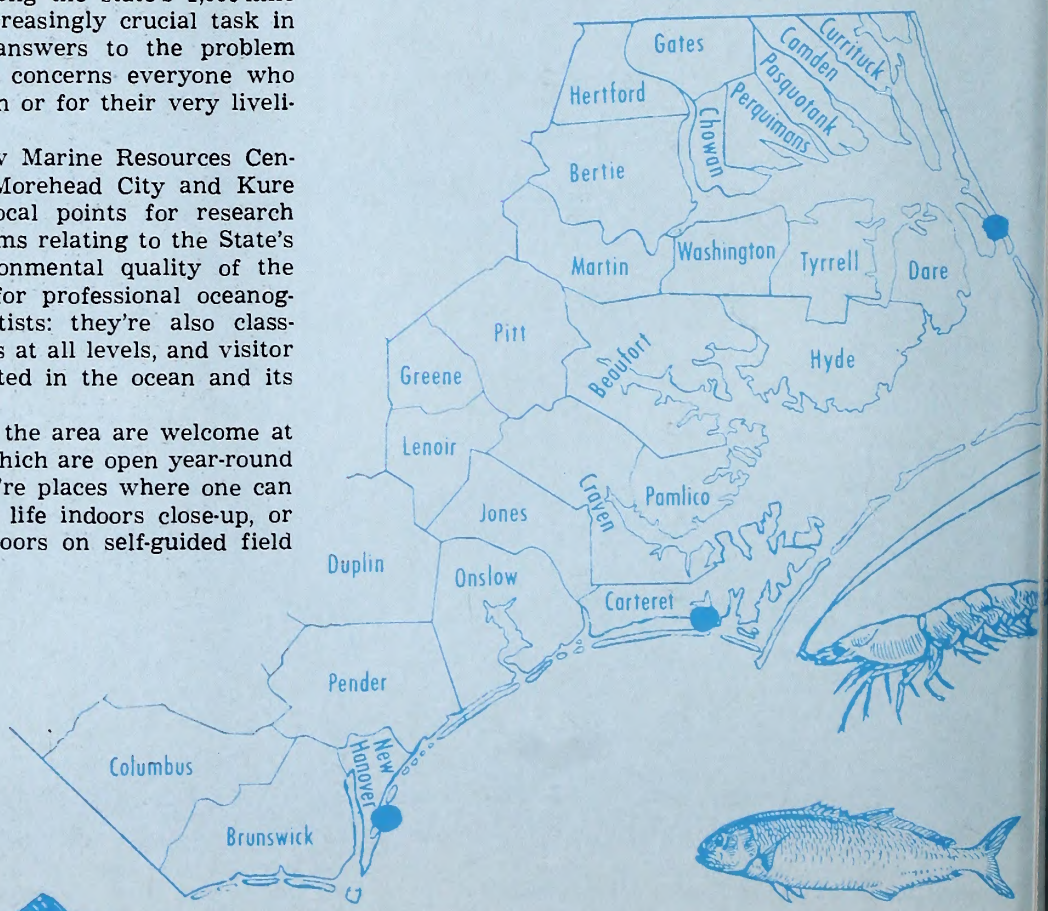
by Emily Hedrick



FISHERMEN, wildlife enthusiasts and other outdoor sportsmen share a deep respect and love of the North Carolina coast. But preservation of marine life as our ancestors knew it along the state's 1,000-mile shoreline has become an increasingly crucial task in recent years. Finding the answers to the problem facing this rich, scenic area concerns everyone who enjoys the area for recreation or for their very livelihood.

North Carolina's three new Marine Resources Centers—located near Manteo, Morehead City and Kure Beach—were designed as focal points for research involving marine life, problems relating to the State's coast, and the future environmental quality of the area. But they're not just for professional oceanographers and research scientists: they're also classrooms by the sea for students at all levels, and visitor centers for everyone interested in the ocean and its secrets.

Tourists and sportsmen in the area are welcome at the multipurpose facilities, which are open year-round and are free of charge. They're places where one can study little pieces of marine life indoors close-up, or where one can venture outdoors on self-guided field



PHOTOS BY STEVE DANIELS

The exterior of the Bogue Banks Center (opposite page) exhibits simple, attractive architecture of the coastal region. Displays range from the colorful exhibit at left to aquatic life in large aquariums such as this octopus (above).

trips to investigate the surrounding beach, marsh or sea habitats.

Since their formal dedication in September 1976, the $4.6 million Centers have attracted hundreds of visitors, many of them school children and sports fishermen and their families already spending leisure time in the Roanoke Island, Bogue Banks and Fort Fisher areas.

One of the more popular features of the Centers are the dozens of aquariums, all containing animals native to the North Carolina coast. Eighty aquatic species are represented in the various tanks, which range in size from 300 to 500 gallons each. Among the more unusual creatures are octopus, lobster, nurse shark, frog fish, gar and other freshwater fish, and sea turtles. There are also the more prevalent shrimp, clams, scallops and crabs: a living seafood platter!

According to Charles Johnson, aquarium display coordinator for the three Centers, only varieties of creatures found along the State's shoreline are included. By summer 1977, he said, a total of about 70 tanks containing a wide range of sea, beach, marsh, fresh water and estuarine habitats will be on display. A number of larger tanks are also planned.

There are also stationary displays depicting such subjects as whaling, fishing, waterfowl, sharks, barrier island ecosystems, diving equipment, shells and navigation. Others include colorful exhibits on the delicate balances of salt marsh ecology, fossils, underwater archeological findings, and the food chains in the marine environment.

Many exhibits are microcosms of the sea itself: small slices of nature to show man's interrelationships with the ocean, and to give a fuller understanding of its dynamics. Members of the Centers' professional staffs are also on hand to answer questions and to give impromptu talks on topics such as how waves are formed, how animals and plants have adapted to their sea homes, and what effects man has had on the coastal environment.

The Marine Resources Centers, administered by the Office of Marine Affairs, N.C. Department of Administration, were designed as learning labs for everyone interested in sea life. The concept was first recommended in 1968 by the President's Commission of Marine Science, Engineering and Resources. Subsequent studies conducted by the N.C. Marine Science Council endorsed the concept of multipurpose centers to assess and help develop coastal and marine resources, to offer information and education programs to the public, students and coastal residents, and to house marine research.

The Science Council developed the plans for the Centers' programs and facilities, and construction funds were provided by the Coastal Plains Regional Commission, a federal/state partnership for economic development, and by the State of North Carolina. Operating funds are now provided by the State.

Each Center is located in a geographically distinct region of the State: on Roanoke Island in Dare County overlooking Croatan Sound; on Bogue Banks in Carteret County near Morehead City at the edge of a 265-acre maritime forest donated to the state by descendents of President Theodore Roosevelt; and at Fort Fisher in New Hanover County south of Kure Beach on Federal Point between the Atlantic Ocean and Cape Fear River. Visitors may want to plan trips to more than one Center in order to make comparisons between different coastal features.

Field trips to the Marine Centers may be an ideal way to round off your next hunting or fishing vacation to the North Carolina coast. Add a new dimension to your weekend: find out more about the dynamics of marine life at the edge of the majestic Atlantic, about the forces that move its water and sand to form our coast, about its plants and animals, about its marshes and estuaries, and about its problems. And perhaps more important, learn what can be done to arrest the growing abuse of this great natural resource.

It's a good place for a family outing, or a solo trip. Lectures, seminars and short films relating to the sea are also scheduled regularly. And members of the Centers' staffs are on hand to answer questions.

So when visiting the State's seacoast, plan to go by one or all of the Marine Resources Centers. Take a peek into the world of the sea: bring back home more than just a bucket of fish!

KERR CRAPPIES

They'll Soon Be Ready

by Gerald Almy

"I used to drive 500 miles to Santee-Cooper Reservoir every spring to catch big crappies," Mickey Johnson said as we slid the 12-foot cartop johnboat into the smooth waters of Butcher's Creek on Kerr Reservoir in the orange glow of dawn.

"Then I found out about Kerr Reservoir. That cut down the drive from northern Virginia to about 200 miles. The crappie are just as big here, even though you may catch a few smaller ones along with the slabs. Then I moved down to Henrico, North Carolina. Now I'm only 55 miles from these dinner-plate sized specks, and you can bet I make it over here more than once a year!"

"You seem to be gravitating a little closer all the time," I needled him. "The next thing I know you'll be living on Kerr with your back door opening onto the lake."

Mickey Johnson has been a crappie fishing "addict" for the 15 years I've known him, and probably longer than that. It's easy to understand why he's been drawn to Kerr Reservoir over the years. This sprawling 48,000 acre impoundment, also commonly known as Buggs Island Lake by its Virginians, provides some of the best crappie fishing in the county. Fish in the three- to four pound class are pulled from the lake's fertile waters every year. Two-pound crappie are not at all rare. In fact, a knowledgeable crappie fisherman will almost surely take several fish in this size range on any good day. The average speckled perch caught from Kerr Reservoir probably tips the scales at 1½ pounds, which is a fine crappie anywhere.

Both black and white crappies are taken on Kerr, with the black species slightly more common in most sections of the lake. These two fish are easily distinguished by their markings and the number of spines in their dorsal fin. Black crappie have seven or eight spines in the dorsal, whites have only five or six. White crappie also usually have prominent dark vertical bar markings along their flanks, while the blacks have a more even "speckled" look, giving rise to the common name "speckled perch."

The males of both species are generally much darker and vividly colored during the spawning period, which occurs from late February through mid-May.

Are They Spawning?

It was in hopes of finding the specks on their spawning beds that Mickey and I had driven from his home near Henrico to Kerr Reservoir this late March morning. Reports of good catches had been filtering in. And with the unusually warm February we had experienced, we felt the fish might already be up in the bushes fanning out crude beds and depositing their eggs amid the willows and gums in shallow water.

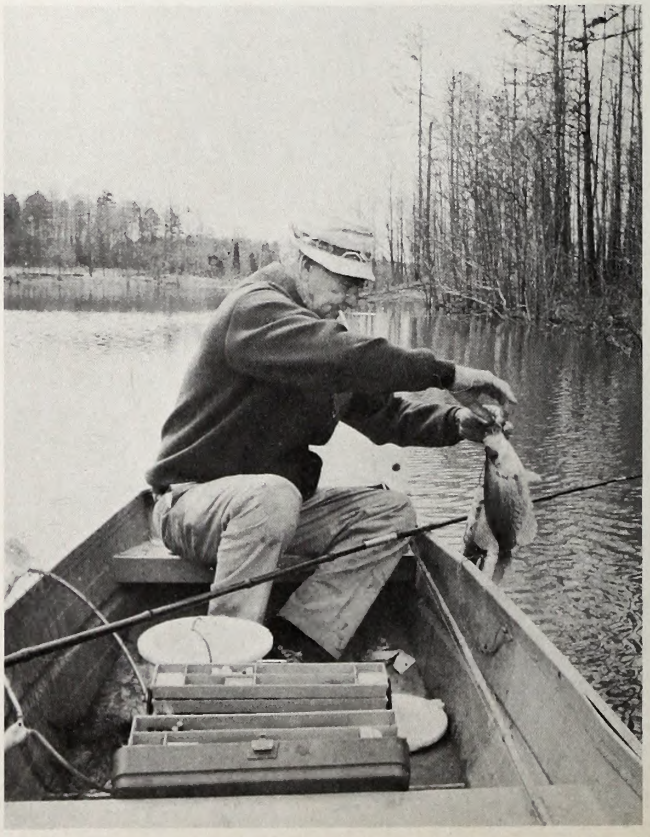
This, to us, is the most exciting time to fish for crappies at Kerr. Probing the shoreline with long, limber cane poles, a short line, and minnow or jig, threading the tip of the pole through dense timber to the hidden beds, and then trying to snake a thrashing two-pound speck out of such thick cover is challenging and exhilarating fishing. Though some anglers scorn the use of such unsophisticated tackle, it has proven itself over time as more efficient than traditional spinning gear for this type of confined fishing.

If anything, it is more sporting to take an egg-heavy crappie out of dense shoreline brush thickets with a cane pole and four or five feet of line than to bring one in on ultralight spinning gear in open water. The fish have incredible strength and heft on their side, and they know how to use it. It's not at all unusual for a fiesty male to wrap you around an underwater snag and shake free seconds after hookup. Or a fat hen fish may wallow back and forth at the water's surface and deftly rip the hole in her soft mouth from the hook wide enough to easily throw the barb.

"Water looks a bit low," I said to Mickey as we approached a point lined with flooded gums and willows—favorite targets for crappies ripe with roe and ready to spawn.

Mickey Johnson adds another chunky female crappie to the stringer. Brushy shorelines like that in the background, paid off on this trip. Look for "stick-ups" and fish in and around the submerged brush.

PHOTOS BY THE AUTHOR



"That it is," he said, measuring the depth at two feet with the butt of his cane pole. I took out my thermometer tied to a string and checked the water temperature in the shallows. "Fifty nine degrees," I read aloud.

Where Will They Be?

"I don't think they'll be right up on shore yet," Mickey said. "With the water this low and only 59 degrees, we'd better stick to brush a little further out —about five-ten feet deep," I'd say.

"I think you're right," I answered. "They've got to be near shore, ready to lay their eggs, but I don't think they'll be in real shallow water yet. Temperature needs to warm up three or four more degrees."

A tree felled along the shore edge extending enticingly into the green water lay 50 feet before us. With the electric motor I eased us to within "pole's reach" and we flipped our minnow-baited #4 fine wire hooks towards the base of the tree where it disappeared beneath the water. Our bobbers were set at about four feet, which proved to be the payoff level this day.

Mickey's cork shot down quickly and his cane pole arched deeply to the pull of a heavy fish. About a minute later our first crappie of the day was hoisted over the gunwhale—a bright male fish of about 1½ pounds.

My bobber sank next, but when I pulled back, I felt the thrashing of a fish for only a second before he had me wrapped around an invisible underwater snag. Fortunately, my ten-pound monofilament held as the hook bent and pulled free. This is why we prefer fine wire hooks for crappie fishing—not only do they keep the bait livelier, they also bend and pull loose easily when you get snagged. It's then an easy matter to straighten the hook to its proper shape with your thumb and forefinger. Snags are so common when fishing for crappies at Kerr that you'd easily go through a dozen or two hooks in a day's fishing if they weren't fine wire.

You may not always score like this from Kerr Reservoir, but once you discover where the spawning fish are, your chances are very good. Fish slowly and carefully.

The next speck that bit didn't get off so easily, and I gradually worked in a blustery female laden with eggs. We estimated her weight at just under two pounds as I strung the fat hen fish.

Spring is not only the most challenging time to fish Kerr for crappies, it's also the most productive, especially for those new to the lake. When water temperatures reach the 50's, the speckles begin massive migrations towards the shallow water, spreading out along the lake's 800 miles of shoreline. During this early period, which usually begins in March, the fish are caught in water depths of 5-12 feet. They are almost always congregated around submerged brushpiles. At this time spinning gear, a fly rod rigged with monofilament, or a cane pole are all practical tools for taking the fish. Jigs from 1/16 to 1/8 ounce and live minnows are the two time-honored baits that score best, though small spinners, spoons, and white spinnerbaits also take crappie at this time of year.

As the crappie move further up towards shore in April, they are best sought out with a long fly rod or a cane pole and short section of monofilament, say three-five feet of 8-12 pound line. The fish venture into water as shallow as 18 inches when actually spawning, though two-three feet is usually preferred. They enter the most gnarled, tangled looking places you can imagine. Because of this, a short line is advantageous for threading the bait into tight pockets of open water or flipping the minnow or jig beneath overhanging branches to the base of willows where the fish lay their eggs on the underwater roots.

After the crappie clear out of the shallows, generally in late May, fishing becomes a deep water proposition. Fish will be found anywhere from 8-20 feet deep, often concentrated in dense schools. Three methods of taking Kerr crappies are popular during the summer, fall, and winter months. One is to fish the bridges which offer deep water, shade, and structure for the fish to hide by. Another method is to drift in deep open water with minnows adjusted at various depths to try to locate roving schools of fish.

The third, and probably most effective strategy for taking crappies after they've spawned, is to plant "hurdles" or large cedar or willow trees in deep water with enough weight attached to hold them solidly in place. These private fish structures often produce well right through hot summer and cold winter weather, after they've been left on the bottom for several months to "age."

But spring is definitely the most exciting time to catch Kerr crappies, as Mickey and I were quickly finding out. By midafternoon we had tussled with close to 40 crappie, 30 of which we kept for the pan. The largest went a hair over two pounds, though we had hooked into a couple of fish which rolled off on the surface that looked much larger than this, perhaps approaching three pounds. The average size of those we kept was about 1½ pounds—prime filleting size and mouth-watering table fare at the hands of Mickey's wife, Anne, the following evening.

For crappie fishing of this caliber, Kerr Reservoir knows no peers.

White Pine Community of the Piedmont

Towering white pines along a Piedmont river? Yes, they're "out of place" and apparently left over from a bygone age. How long will they endure?

by John C. Clamp
and
Rowland M. Shelley
Invertebrate Section, Research and Collections Division,
North Carolina State Museum of Natural History
Photos by Chris Marsh

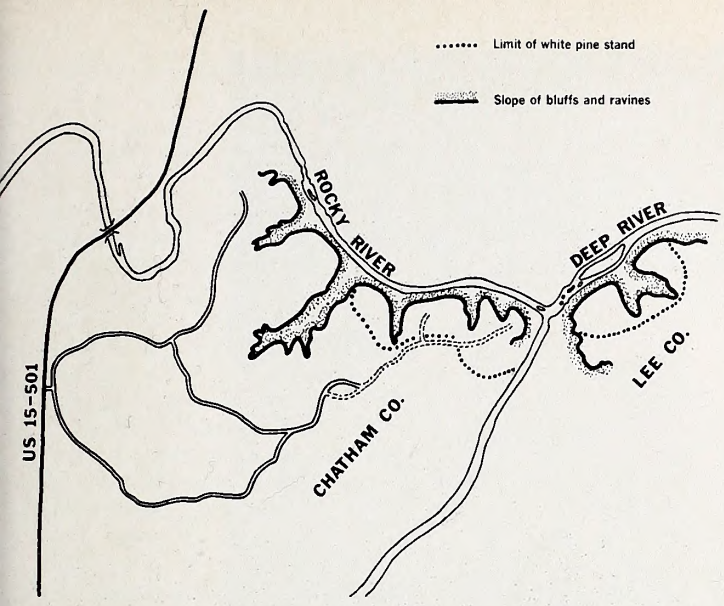
ALONG the south banks of the Rocky and Deep rivers, near their confluence, lies an area of Chatham and Lee counties known as the "White Pines." The average North Carolinian, looking up at one of the steep (100-foot) bluffs, might easily imagine himself in the mountains, but this small area of the Piedmont is many miles from the Blue Ridge Front.

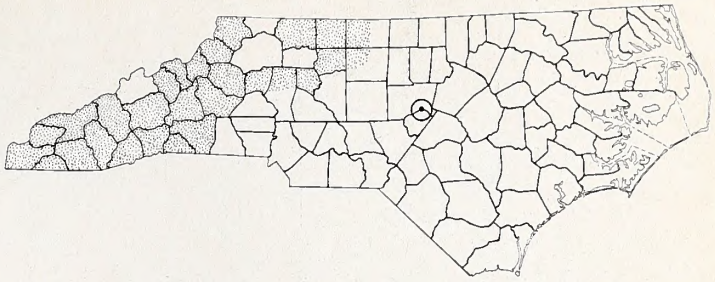
The locality's most remarkable feature is a 30-50 acre stand of white pines, *Pinus strobus,* which is readily visible upon entering the area. Their bark is gray-green, smooth, and thin, a characteristic especially noticeable in saplings. Older trees have thicker bark, split into rectangular blocks, but the color is still unmistakably gray. The bright, blue-green needles are arranged in clusters of five, and the cones are slender with flexible scales. All other North Carolina pines have clusters of two-three needles and stout cones with rigid scales. Large white pines can often be identified by the "upswept" growth pattern of the branches, even at great distances, and especially in winter when they are prominent among the hardwoods.

White pine is common in the cool environments of the mountains and western Piedmont, but this stand is over 100 miles east of its natural range. A population of plants or animals detached from their normal geographic range is termed a *disjunct* and exists only in areas with special, localized environmental characteristics. In Chatham and Lee counties, these essential conditions are provided by a line of north-facing bluffs carved by the Rocky and Deep rivers. They are high and deep enough to create a cooler "microclimate" than in the surrounding areas, conditions favorable for white pines but somewhat detrimental to the climax deciduous forests of the eastern Piedmont. Consequently, white pine can successfully compete with the hardwoods, and grow and reproduce among them. Unlike other pines, white pine seedlings can survive in forest shade, a property which insures their persistance in the area.

Left Over From Ice Age

White pines have existed in Chatham and Lee counties for thousands of years. At the end of the last Ice Age, approximately 10,000 years ago, plants adapted to cool environments covered a much larger part of the





The distribution of the white pine, Pinus strobus, in North Carolina is shown as the shaded area on the State map above. The disjunct eastern Piedmont stand is indicated by the circled dot near the center of the State. Topographic details of the "White Pines," showing bluffs along Rocky and Deep rivers are shown at left.

The interesting variety of plants present in the white pine community includes ferns, various ground covers, rhododendrons as well as the mature pines themselves.

State than they do today. As the climate warmed they were replaced by species more tolerant of higher temperatures. Today, cool-adapted plants remain in only a few isolated spots in the eastern Piedmont, places like the "White Pines," and the "Hemlock Bluffs" on Swift Creek near Cary in Wake County. These stands are referred to as *relicts*, since they have been "left behind" by shifting of their ranges due to climatic changes. The Piedmont white pine stand is thus both *relict* and *disjunct*.

Because of the unusual environmental and floral characteristics of the "White Pines," we conducted a survey of certain animal species during the summer of 1975. Collecting was restricted to large invertebrates living in the leaf litter of the bluffs and intervening ravines. Due to time restrictions, no insect collections were made.

In addition to hardwoods and white pines, the ravines are covered by dense growths of wild azalea, *Rhododendron nudiflorum*, and contain large numbers of small gullies formed by rivulets of rain. These are filled with thick layers of decaying leaves which are ideal habitats for many invertebrates. They present a sheltered, moist environment to snails, slugs, millipeds, and isopods, most of which feed on the leaf mold in which they live. These invertebrates will die if dried out; centipedes and spiders are less sensitive to dry conditions, but frequent the gullies to prey upon the smaller animals.

In contrast, fewer suitable habitats occur on the bluff faces. In a few places erosion has formed shallow depressions which, when filled with leaves, are havens for moisture-loving invertebrates. Except for these depressions, the bluffs are quite dry and covered with only a thin layer of leaves.

Tiny Wildlife

Predictably, the gullies and sheltered spots in the ravines harbored a greater diversity of invertebrates: 61 species were found there, as opposed to only 31 on the bluff faces. The difference was mostly due to a greater variety of millipeds, centipedes, and spiders in the ravines than on the bluffs. However, essentially the same land snail fauna was found in both habitats, probably because of their ability to seal off the shell entrances with a thick, mucous barrier which prevents moisture loss. Thus, they can survive long, dry periods. The single isopod species was collected from moist spots in both environments.

One invertebrate was encountered that had not been recorded elsewhere in the eastern Piedmont—a native

• **continued on page 26**

Our White-Tailed Deer

AN INTERESTING ANIMAL

by Lunette Barber

THE story of "Bambi" is fascinating reading (if not a bit misleading) for children, but reading the true story of our white-tailed deer is more interesting to adults.

Although this past deer hunting season was a successful one, many sportsmen again failed to "get that big buck" they so proudly boasted of knowing exactly where to find. Some of them may also feel disappointed in not even finding a pair of antlers lying around that could be shown as a trophy.

Perhaps many such failures result from not remembering, or not knowing some of the characteristics of our white-tailed deer. Looking to greater success next season, perhaps a thorough understanding of deer facts will be helpful. Let's trace the life cycle of that "big buck" that is so eagerly sought:

The period of gestation for the white-tailed doe is about 200 days, and they drop their fawn around mid-April to mid-May. The fawn, at birth, weighs approximately four pounds, and is endowed with a naturally camouflaged brown coat dappled with white spots that blends well with the leaves and foliage on the forest floor.

The fawn spends its daylight hours lying quietly on the ground while its mother ranges for food nearby and returns to let the youngster nurse from time to time throughout the day. Prior to weaning, fawns usually follow their mothers only at night and in the early dawn before sunrise.

Most fawns are completely weaned by mid-October. About this time they begin to range for their own food, and they exchange their dappled coat for their first winter coat. Adult deer sport two coats each year—the summer coat is a short, sleek and shiny coat of reddish brown while the winter coat is a dull brown with a blue or gray tinge.

The white-tailed deer is an excellent swimmer, and its winter coat has air-filled hairs which enable it to ride fairly high in the water. Adult deer can swim a steady four miles per hour and have confidence in their ability in the water.

The breeding season (called the rutting season) for the white-tailed deer arrives in October along with the brisk autumn weather and usually continues through November. After the breeding season, the white-tailed deer usually bands together in small herds or family groups. They are not migratory, and seldom travel beyond a half-mile radius. During the rutting season, however, bucks may travel more extensively in their search for does.

Generally the bucks are so intensely pre-occupied with the demands of the rutting season that they do not eat enough to maintain their full energy during this period; the end of the season finds most of them somewhat emaciated. Meekly following the female leader of the herd to which they become attached, they rest and rebuild their physical condition in preparation for another season.

Sometime within the period between late December and mid-March the bucks shed their antlers, and here begins a story about a group of most remarkable characteristics that are singularly peculiar to the deer family. Notice we said "antlers" and not "horns" because *deer do not have horns,* although some very prestigious publications have sometimes used both terms when describing deer.

Perhaps the reason last season's hunters failed to find a pair of antlers is there were none to be found; remember, they were shed by their host almost a year ago. An article "The Mystery of the Deer Antler" in *Santee Cooper Country—Vacation and Outdoors,* October 1975, by Dome Publishers, Inc., Santee, S. C., says: "Based on data gathered at the Welder Wildlife Refuge in Texas, there are four main reasons: There may have been a small number of antlers to begin with; they were probably hidden in spring and summer vegetation; they were probably badly decomposed by the elements (rain leaching the calcium); and finally, and most likely, they were gnawed and consumed by various species of mammals, especially rodents. Concerning the latter, the study found that, in 15 percent of the cases, deer ate or chewed on their own shed antlers."

As the sunlight hours of early spring—late April and early May—become noticeably longer, the growing and developmental season for the buck's antlers begins and continues for about six months.

In a sense, deer are somewhat like some vegetables —the longer the daylight hours during their growing season the larger the vegetables grow, and much the same applies to the deer family including (for most) the size of the antlers that grow on the bucks. Note that we have the larger Alaska moose with very large antlers in the far North, the larger white-tailed deer (up to 400 pounds) in upper New York, becoming smaller southward to the tiny Florida Key white-tailed deer in Florida reaching scarcely two feet in height.

The increased hours of daylight penetrates the brain of the buck through his eyes and causes certain hormones to start surging through his blood, stirring his sex glands, and starting his new antlers growing.

The reddish summer coat of this young buck (left, above) gleams in the late afternoon sun. "Button" antlers covered in velvet are growing. The shed antlers (below) are usually eaten by mice and other rodents.

From a pair of tiny "buttons" in early spring, the antler growth speeds up to as much as a half-inch a day in May, to the first two forks in June, and reaches maximum growth by late July.

Throughout the growing period the buck's antlers are a mass of connective tissue receiving blood and nutrients from the body for their proper growth and development, and the whole is covered with a fuzzy protective coating called "velvet." The overall condition of his health, the environment (excellent, good or poor) in which he ranges and feeds, and the length of his exposure to daylight, plus age, are the factors governing the size of his antlers for any given year. Therefore, age is not the sole factor determining antler size—a fully nourished three-year old could well have a larger pair of antlers than an old buck on an overgrazed range. If, at the beginning of the antler growth period, a buck should be accidentally castrated, there will be no antlers.

Many hunters believe the number of points on an antler indicates the deer's age. From what we've said, they will note that this is not true. The age of a deer can be determined by examining the teeth.

From late July through September, a change in the development of the buck's antlers takes place. The flow of blood and nutrients diminishes gradually during this period and the antlers become progressively harder by calcification. Usually by the end of September, the antlers are very hard indeed, becoming pure bone, and the velvet starts to shed as the flow of blood recedes and finally ceases.

The peak of the annual rutting season is usually October and November, and "that big buck" will then be very busy shining his head ornaments by rubbing them against rocks and trees to make himself more attractive to the opposite sex. At the same time, and by the same method, he is "sharpening" those antlers to better fight off other bucks competing for the doe's favors.

The marking (scars, scrapings, and residues) on the rocks and trees from the polishing and sharpening activity are called "buck signs," and knowledgeable hunters will be on the lookout for them in the areas they hunt.

Thus we close a full year's cycle in the life of "that big buck."

Here are some more interesting characteristics of our white-tailed deer: Very keen eyesight; very keen sense of hearing; very keen sense of smell. Very fast —can leap 15 to 20 feet, and run up to 40 miles per hour. Given to hiding in thickets and swamps to avoid his enemies. Very shy and timid. The buck is usually more wary than the doe—when startled he "blows" somewhat of a whistling sound, seemingly to warn other deer in the area, and takes off in a spurt of four or five leaps followed by a great, high jump, and then runs at top speed. Except for the winter season, and the limitations fixed by a specific range, food is seldom a problem, for he has a goat-like appetite, he is a vegetarian, and will eat almost anything that is green except onions.

The deer is probably the sportsmen's favorite big game mammal, and thus its most important use is to furnish sport, recreation, and food for the hunter. Also its aesthetic value should not be overlooked.

North Carolina should be very proud of the build-up of its deer population during the past 30 years. This was made possible by much hard work, much interest, good legislation, and cooperation.

It's mighty tempting to try to keep wildlife such as this great horned owl (left) as pets. But it is illegal plus being very difficult. If you must care for orphaned wildlife, get a permit from the Wildlife Commission first.

Of Pets and Things

by H. Lea Lawrence
Nashville, Tennessee
PHOTO BY AN PAINTER

"OLD Noisy" is an upright piano four-feet high, and is said to be the highest piece of furniture in the house. Its western summit is called "writing place," since the telephone is situated just around the corner. Close to the western summit there is the dried and shriveled carcass of a chameleon. No one has explained what the chameleon was seeking at that altitude.

Well, almost no one, but I can provide the facts. The chameleon which had recently passed on to that "happy land" was just another in the series of pets my two young boys have bought, captured or traded for, and its demise was precisely that of other pets now long gone and forgotten.

The broad range of these pets is somewhat startling when I think back over them. It all started with goldfish, but once the momentum began to build, everything was fair game—or fair pets. Turtles of varied sorts, both the water kinds and the terrapins; snakes—mostly green snakes; minnows (seined from a nearby creek, along with crayfish, mayfly and stonefly nymphs, hellgrammites, cranefly larvae, etc.;) birds of sundry species, either young fallen from the nest, or adult birds with some infirmity; guinea pigs; hamsters; iguanas; mice; lizards of the pet shop and field variety; insects ranging from the tiniest ants to spiders (not really insects, of course, but classed as such in most people's minds;) to praying mantises; salamanders; catfish, bluegills, carp and bass; frogs; toads; and, once, almost a chipmunk, which was too fleet of foot to suffer the indignation of a cage.

All this excludes miscellaneous cats and dogs, because these alone would make a story.

It certainly must be the conquest that is important in these little boys' minds; like Frank Buck of the "Bring 'em back alive" fame. For when it comes to caring for this assorted menagerie, then things take a different turn. Apathy sets in. How long can a hamster go without water? How long can a chameleon go without meal worms?

These are questions I cannot precisely answer, but I can give an accurate account of the results. My backyard, in some period many, many years from now may be classed as the biggest "find" by archeologists of whatever century it may be. Imagine digging up such an assortment of bones—and all in one isolated locale! ". . . surely here we have an ecological niche!"

I found myself recently on the ropes, being pummelled by both boys over the question of a pet monkey. My head was reeling, and my knees giving away, but with a sudden surge of courage and energy, I fought my way back, took a steady stance, and retaliated with astounding effect!

Our dog—one of our dogs, this one a house dog—I explained, would be highly upset with a monkey bouncing around the house, and might, in fact, take it for some kind of delicate morsel. The bell sounded, and I was soon safe in my corner. I had won a TKO for this match, anyway. But I find myself with a feeling of apprehension over what will be the outcome of the next bout. I've won some, but I've lost a lot, too!

The problem actually seats itself in the fact that one pet won't do; there have to be several of them at one time. Recently and I think some still survive, we had a fence lizard; a chameleon (the one I spoke of earlier;) three turtles (all of a different variety;) an iguana; a hamster; four minnows (they went fishing with me and these were left over;) an injured screech owl; a jar full of small praying mantises; another jar full of crickets (big money-making deal in the process;) still another jar full of earthworms (same idea in regard to private enterprise;) two moths and a sorry-looking butterfly; our two dogs, one in a kennel out in back, and one in the house; and a kitten that took up with us despite the threat of the dogs.

My wife, with a strong aversion to things that crawl, hop, swim or fly, stays in a state similar to that of a person who inhabits a haunted house. Every noise, movement, or strange object lying in a shadowed spot becomes a potential menace to her health and safety.

• continued on page 26

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

National Wildlife Week

March 20-26 marks this year's observance of National Wildlife Week (see page 26). If you would like free material to help you with your "week", write George Batts, Wildlife Week State Chairman, Rt. 3, Box 127, Fuquay-Varina, N. C. 27526.

Wild Foods

N. C. Wild Foods Weekend will be held April 15-17 at Betsy-Jeff Penn 4-H Center near Reidsville. The program will begin at 7:30 p.m. on Friday, April 15, and will include experiences in identifying, gathering, preparing and eating a wide variety of edible plants and other wild foods under the guidance of specialists in this field. Cost includes a $5 registration fee and moderate rates for meals and lodging at the 4-H Center. For complete information, please write or phone Wild Foods, Rockingham Community College, Wentworth, N. C. 27375.

Bass Fishermen Can Help

Bass fishermen and bass clubs are being asked to help with a largemouth bass catch survey ("Wildlife," December 1976, page 12) in order to provide data needed for better management of the bass in North Carolina. Anyone interested is urged to write Larry Birchfield, Division of Inland Fisheries, N. C. Wildlife Resources Commission, 325 N. Salisbury St., Raleigh, N. C. 27611, for details.

Fishing Regulation Hearings

Public hearings to discuss 1978 fishing regulations will be held as follows (all beginning at 7:30 p.m.):

April 4, 1977	Courthouse	Edenton
April 5, 1977	Courthouse	Jacksonville
April 6, 1977	Courthouse	Nashville
April 7, 1977	Courthouse	Elizabethtown
April 8, 1977	Courthouse	Graham
April 12, 1977	Courthouse	Sylva
April 13, 1977	Collett Street Recreation Center	Morganton
April 14, 1977	Courthouse	Yadkinville
April 15, 1977	Central Elementary School	Albemarle

A Passenger Pigeon Parable

No one knows when the passenger pigeon first appeared in North America or how long it took for the species to reach its maximum estimated population of between five and ten billion. The passenger pigeon was very abundant when the first European settlers arrived in North America in the early 1600's. Within the short span of 300 years, passenger pigeon populations numbering in the billions crashed to extinction. The last surviving member of the species died in the Cincinnati Zoological Park on September 1, 1914.

The passenger pigeon's scientific name—the one which permanently *Ectopistes migra*-identifies it—is *torius*. The parts of an animal's scientific name are supposed to describe its structural characteristics —color, habitat, what it eats, where it was first observed, or who first

PAINTING BY BOB HINES

by Kirk H. Beattie

observed it. The passenger pigeon was rather oddly assigned two names with the same meaning. *Ectopistes* is from a Greek word meaning migratory; *migratorius,* from the Latin, means the same thing.

Early explorers of North America reported seeing great flocks of passenger pigeons. It was apparently not unusual for the migrating pigeons to nearly blot out the sun for several days at a time. The passenger pigeon lived in the eastern half of the United States and the southern one-fourth of Canada. At its population peak there may have been more passenger pigeons in that area than all other birds put together. Historical records suggest that passenger pigeons wintered in what then was North Carolina as early as the late 1500's.

The unbroken deciduous forests of eastern North America provided the passenger pigeon with great quantities of mast and fruit. Acorns, beechnuts, chestnuts, berries, grapes, and wild fruits fueled the fires of billions of pigeons. The native Indians had always killed as many as they could for food and the early colonists did the same. However, miniscule consumptive use of the passenger pigeon by the Indians and colonists could not begin to make a dent in their countless numbers.

The interests of the early colonists and settlers of the eastern United States conflicted with the interests of the passenger pigeon. The passenger pigeon was totally dependent on the mast-laden woods for its sustenance and breeding habitat. Forests presented an obstacle to be overcome by early colonists. The forest had to be cut, burned, and plowed before crops could be planted. The forest also housed many "dangerous" animals and provided cover for Indian attacks.

Most birds use several methods for achieving a balance between survival and the danger of overpopulation. Protective coloration, migration over great distances in times of food shortage, building sturdy nests in safe places, laying several clutches of eggs each year, and laying a large clutch of eggs when there is great risk in raising a brood of young contribute to the survival of bird populations.

Bird Had Serious Deficiencies

The passenger pigeon was deficient in many of these respects. Its blue and slate coloration offered it little protection either in flight or while nesting in the forest. Flimsy nests were hastily thrown together and a single tree often bore the brunt of 50 or more nests, often resulting in shattered limbs and broken eggs. Most birds lay many eggs in hope of raising an adequate brood. The passenger pigeon normally laid a single egg in its flimsy nest. The passenger pigeon was a very social breeder and colonial nesting areas often covered dozens of square miles of forest. One nesting colony discovered in Wisconsin extended for more than one hundred miles. A strong wind often resulted in the devastating loss of countless numbers of eggs and young birds (called squabs).

The westward expansion of settlers was accompanied by large scale clearing of the mature forest. A small segment of the passenger pigeon population might possibly have survived despite the reduction of its habitat, but the birds could not survive the wholesale trapping, shooting, and clubbing of its numbers that reached its peak between 1860 and 1880.

The competent conservation historian James Trefethen had the following to say about the commercial harvest of the passenger pigeon: "One gang of netters invaded a nesting colony in Newaygo County, Michigan, in 1875. Not only did they string their usual nets but they felled hundreds of trees, many containing up to 50 nests each, to obtain the squabs. The warehouse where the birds were stored for shipment was 20 feet by 60 feet, and most of this floor space was covered with squabs to a depth of three to four feet. In the same year, netters in Oceana and Traverse counties shipped two million pounds of squabs and 2,400,000 older birds to markets in American and European cities. In 1878, the last great nesting colony was discovered near Petoskey, Michigan. Twenty-five hundred netters descended upon it. Within the space of a few weeks they marketed 1,107,800,066 pigeons."

Intensive market netting and trapping of passenger pigeons was nonexistent in North Carolina but reached such severe proportions in northern states that the birds were depleted in North Carolina in the late 1800's. The last passenger pigeon shot in North Carolina was killed October 20, 1894, in Buncombe County.

The market netters (not "hunters") did not kill the last of the pigeons because populations became too low to make netting profitable. Commercial netting and destruction of virgin forests played a major role in the downfall of the passen-

ger pigeon. The specialized habits of the passenger pigeon and its low egg-laying capacity, flimsy nest, herd instinct in migration, and inability or unwillingness to adapt to changing conditions contributed to its demise.

Some authorities have suggested that the passenger pigeon required a critical minimum population size to stimulate breeding. Once the population sank below this level it may have been doomed to extinction regardless of man's efforts. Unsuccessful attempts to breed passenger pigeons under artificial conditions support this reasoning.

Sportsman Not to Blame

Several writers have mistakenly blamed the late 18th and early 19th century sportsmen for the extirpation of the passenger pigeon. An important distinction must be made between sportsmen and the class of persons who contributed to the demise of the passenger pigeon. Individual sportsmen and sportsman organizations were successful in getting laws passed prohibiting the killing of pigeons on nesting grounds, but the laws were impossible to enforce. Commercial netters, commercial harvesters, market gunners, and fast-buck artists played a crucial role in the systematic destruction of passenger pigeons, not "sportsmen." Although dozens of pigeons could be bagged from concentrated flocks with one shot, shooting was primarily used to obtain meat for family use. The professional "pigeoner" used baited drop nets to capture hundreds of birds at one time.

James Trefethen, author of *An American Crusade for Wildlife*, said that the passenger pigeon did not die in vain. The near loss of the bison and the loss of the passenger pigeon became one more standard around which the pioneer conservationists of the time could rally.

Aldo Leopold, naturalist, conservationist, philosopher, and author of *A Sand County Almanac*, expressed the sorrow of many persons who lamented the passing of the passenger pigeon in A Monument to the Pigeon:

There will always be pigeons in books and in museums, but these are effigies and images, dead to all hardships and to all delights. Book-pigeons cannot dive out of a cloud to make the deer run for cover, or clap their wings in thunderous applause of mast-laden woods. Book-pigeons cannot breakfast on new-mown wheat in Minnesota, and dine on blueberries in Canada. They know no urge of seasons; they feel no kiss of sun, no lash of wind and weather. They live forever by not living at all.

"T'WAS ALL BECAUSE OF ME!"

I watch the golden sun appear,
The grass with dew, just like a tear;
But sparkling in the daily light,
It makes the world seem twice as bright.
The bird has left his cozy nest,
To sing his song, now for food, in quest;
His gay melody drifts on the breeze,
To awaken the flowers, the shrubs and trees.
Animals in their beds and den,
They too hear the symphony once again;
And each one from his rest doth arise
To roam the earth 'neath dawn-lit skies.
The bubbling brook with freshness filled,
Reaches a falls, its contents spilled;
And in the spray a rainbow's end,
Promising Man, death never again.
But then a tree goes up in flame,
Already too late, head hung in shame;
I hear the creatures scream, then flee,
Then stop to think, "T'was because of me!"
Many men are sent to fight the blaze,
The battles last for days and days;
And then the war is won, but lost,
Still lingering on, the priceless cost!
The trees are black and fallen down,
Erosion takes away the ground;
A tear-filled fawn gasps her last breath,
To the forest 'tis known as the "Evil Black Death!"
The streams infiltrated with dust and debris,
The fish float on top, "T'was all because of me!"
Tomorrow the sun will rise just as before,
But the life of the forest will be there no more!

George G. Glass, Jr.

THE CROW

NATURE'S PROBLEM CHILD

by Jim Dean

THE American crow is one of nature's heroic villains, widely admired and perhaps equally despised. Some think of the crow as a swashbuckling rogue—the Errol Flynn of birdland. To others, he may be more nearly the Clyde Barrow of the airways.

If you're a hunter or an amateur naturalist, no doubt you have a high respect for the crow and his native intelligence, but if you're a farmer trying to get a corn crop off the ground, the crow's resourcefulness may not be so greatly appreciated.

What happens is that when the corn is first planted, crows may gather and eat some kernels before they have sprouted. Some farmers, in an effort to discourage this practice, have scattered poisoned corn in the corners of fields. The crows eat the scattered corn and die.

It would be bad enough if only the crows were killed (they're now classified as gamebirds), but there are biologists who believe that other seed-eating wildlife species may also be poisoned unintentionally. Besides, the use of many poisons is illegal, not to mention hazardous to humans.

"It's hard to say how big or widespread the crow and wildlife poisoning problem is, but it may be significant," says Charles Hill, a game biologist and management supervisor for the N. C. Wildlife Resources Commission. "I don't know of specific studies, but such species as bobwhite quail, doves, grouse and turkeys are all likely to be accidental targets. Some animals, like raccoons and squirrels, may also be affected."

Charlie recently met a farmer (who also hunts) who seems to have found a practical solution to the problem.

"This fellow is a highly successful farmer," says Charlie. "One of his neighbors apparently recently used corn treated with a highly toxic poison to kill crows. It isn't known for certain whether wildlife populations might have gotten into it, but there have been no wild turkey tracks in this field since the poisoned corn was put out. Before that turkey tracks were common.

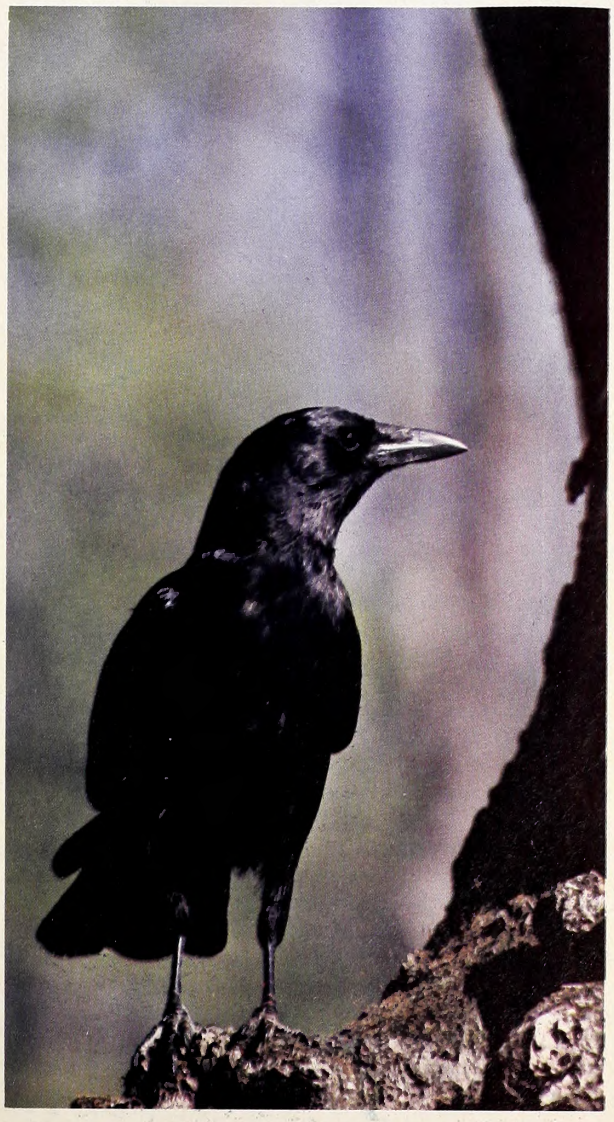
"The concerned farmer says that the use of poisoned corn is unnecessary," explains Charlie. "Instead, he recommends that farmers merely scatter a rather small amount (a quarter or half bushel) of untreated corn in the edge of the field."

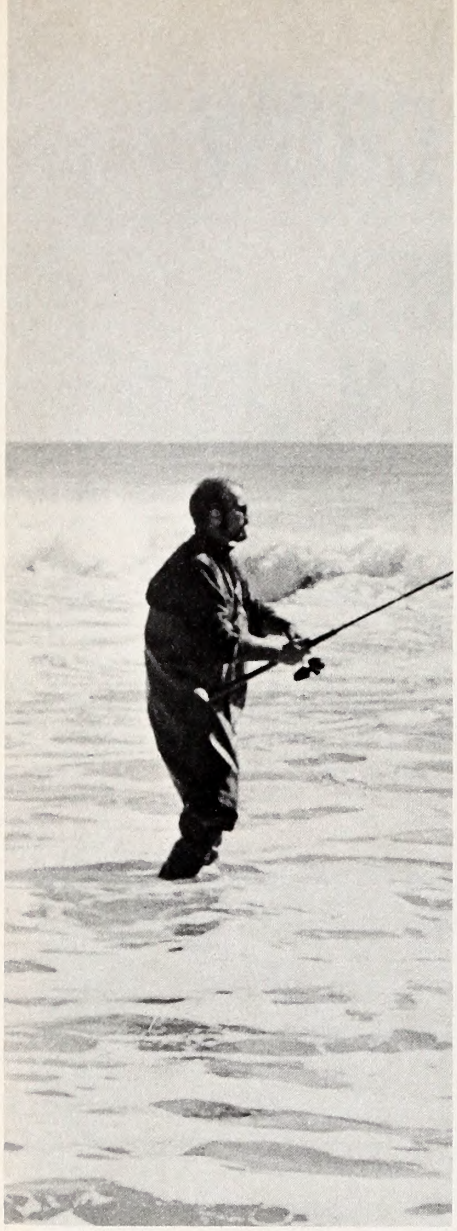
"This farmer has been doing this for some time, and he says that the scattered corn attracts the crows and keeps them out of the crop without actually doing them any harm," adds Charlie. "In fact, he says that it does not require any more untreated corn than poisoned corn, yet it accomplishes the same purpose. Therefore, it's not only effective, but it's less expensive."

"I know that this tactic has worked well for him," says Charlie. "There are many situations where this would be highly feasible for attracting crows, while at the same time not endangering valuable wildlife species."

This spring, if crows are a problem, give it a try. It was developed by a successful farmer, so it should work. Also, it won't harm your quail, doves and turkeys.

PHOTO BY F. EUGENE HESTER





The Evolution of a Drum Fisherman

by Tate Sanders

A few months from now, early summer will come to the coast of North Carolina, and the red drum will start to bite again. These next few months should give the drum fishermen plenty of time to replace lines frayed from being dragged back and forth across the sandy bottom by the pounding of the waves, rebuild the rigs that are necessary to hold a big fish, and contemplate that maybe this year, a really big one will take the bait.

Most of us have seen the surf fishermen standing for hours on a lonely beach, rods settled in sand spikes, waiting for a strike. We have also seen the classic photograph of the surf fisherman dragging a huge fish down the beach towards the lighthouse. As a child, I had watched the surf fishermen on the beach. but they never seemed to catch anything, or at least not at ten o'clock in the morning. But, they are intriguing. What were they doing out there?

Several years ago, while I was camping at a wild beach in Carteret County, I came across a surf fisherman. It was after dark, and I was looking for wood for the campfire that I was sharing with several friends. He invited me to his camp for coffee, and I noticed that he was alone. He told me that he was going to catch a drum that night when the tide started to come in, and he said that he was waiting for the wind to rise and blow "straight off the beach," and when the moon was high, about two o'clock, the cooper-hued fish would start biting. He said that he'd never caught a big one, but that such a monster would hit hard, run 50 yards straight out, and then, as likely as not, turn and run straight back in. I never found out if he caught that fish, but he sure put the hook into me!

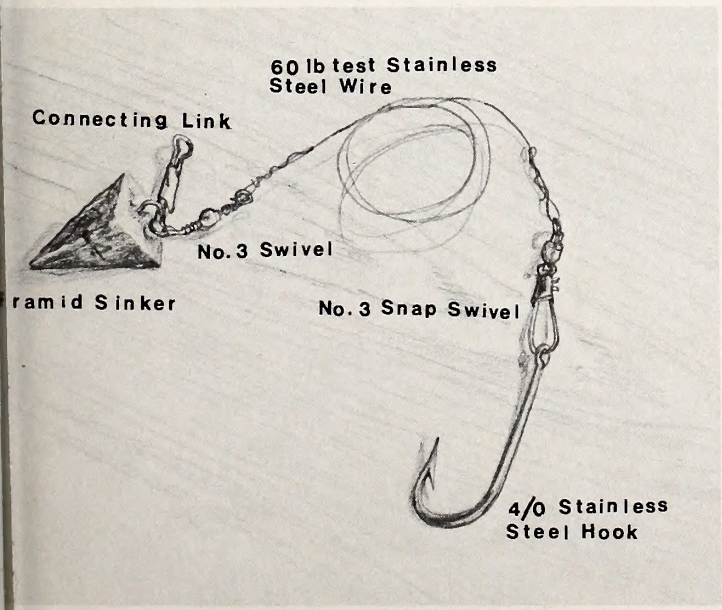
I bought a 9½ foot rod and a large saltwater spinning reel. This rig, plus a half pound of bait shrimp, would be carried along with my camping equipment on weekend trips to the coast. At first, I fished at convenient hours, but I never caught much. Occasionally a sea mullet or a spot would come along to keep up my interest. I began to talk to some of the other surf fishermen, several of whom consistently caught good fish. One old man in particular had been fishing this strand of beach for 20 years. He was always there when I hauled my gear down to the point, and he instructed me in the finer points of catching a drum.

Surf fishing, like any other kind of fishing, is an art. The successful surf fisherman must properly tie in a number of related elements, watch the weather,

PHOTO BY JOEL ARRINGTON

This is the classic view of the "average" red drum or channel bass fisherman. It does happen this way, but more often the angler is drenched with surf and stumbling up a pitch black beach.

SKETCH BY HARLAN NEEDHAM



There are certainly more ways than one to rig for red drum, but here is a successful method. Make sure all your tackle, including the terminal rig, is strong and ready to go.

wish for luck, and wait for the fish. The old man advised me about these elements—bait, tide, wind, hook size ("Those little hooks'll straighten right out if a big drum takes your bait"), while he hold me stories about fish caught in years past. "Charlie hooked him up at this end of the Island. It took him 55 minutes to land him a mile and a half down the beach. He weighed 35 pounds."

Finally, one May, I caught my first red drum. I was fishing at an inlet in a hole that I knew about. The sun was going down and the tide was coming in. For the first time, I felt like I knew what I was doing. Now, it was up to the drum to cooperate. The blues had been biting off and on all afternoon. I was using cut mullet for bait and four ounces of lead sinker to hold it on the bottom. But the wind was hitting the beach crossways, and I couldn't keep the baits out in the water very long, because they were being washed back up on the beach. I was using two rods—as soon as one bait was washed up, I'd throw it back out while the wave action was dragging the other bait through the hole. Earlier, I had asked some of the old timers how I would know if a channel bass took the bait, and they assured me that I would have no problem. "When he hits, he'll just about pull the rod out of your hand".

I had just thrown out a bait, and was walking back to the sand spikes when something hit my other rod and pulled it over. I threw down the rod that I had in my hand, ran over to other one, picked it up and felt a big fish still on. The experienced drum fishermen love to talk about how hard big red will pull, and how powerful his runs are. Well, they know what they're talking about. That fish and I had a tug of war going, and I was yelling my head off with the excitement. When it was all over, it had only lasted about three minutes, and the fish only weighed seven pounds, but I had caught a drum.

I fished five weekends that summer and fall, and I caught plenty of blues, sea mullets, an occasional flounder, and some trout. And I hooked two more drum. The first I lost when I tried to bring him in too fast; the second one pulled the hook out of the bottom rig. I learned the hard way why the experienced drum fishermen build their tackle instead of buying it. I got rained on, bitten by sandfleas, and developed sore feet from walking up and down the beach carrying all my gear. I also watched sunsets and sunrises over the ocean, saw a sea turtle laying her eggs one moonlit night, and watched the sea birds fly up and down the beach.

In a few months, the drum will start biting again. I've got to change the line on one of my reels and replace a few rusted eyelets on a rod before then. Maybe this year I'll catch a big one.

BAKED PUPPY DRUM

Scale and dress a six- to eight-pound drum.
Gash the fish five times across each side.
Place sliced Irish potatoes and onions beside the fish in a pan.
Place six slices of bacon and a few slices of onion on top of drum.
Season with salt and pepper.
Add three cups of water, bake at 450° (preheated) for 45-60 minutes.
After fish is cooked, thicken the gravy with flour and serve on top of fish, onions and potatoes.
Serves six to eight people.

Stem to Stern

BY ED JENKINS

THE price tag of the average new boat and motor purchased today is fast approaching the cost of the family automobile and is probably the third largest investment a person will make. A recent definition given for a *boat* is "A depression in the water into which one pours money." Unfortunately, too many people find out too late that they cannot afford the boat they bought.

Two things should be foremost in the prospective boat owner's mind when selecting a boat: (1) how the boat will be used, and (2) one's budget.

One should know where and how he plans to use a boat before he decides on a particular model. A bass boat may suit the angler's fishing needs ideally, but if he and his family enjoy cruising and skiing, as well as fishing, perhaps a runabout would be a more practical choice.

When considering the purchase of a boat, look beyond the initial cost of the boat, motor and trailer. Take into account all items that may be required such as safety equipment, jack and spare wheel for the trailer, extra fuel tank, water skis and other desired items. Many boat dealers sell boats as a package deal with the boat fully equipped. Boat insurance and any equipment added to the vehicle which will tow the new boat will be extra. A large boat may require a special trailer hitch, heavier suspension system, larger radiator and transmission cooler to be installed on the towing vehicle. One should check his vehicle owner's manual to see exactly how much weight his vehicle is designed to tow and compare it with the total weight of the boat, motor, trailer and equipment before a larger boat is purchased.

One should also consider the continuing cost of ownership. Even after the monthly payments are over, you can plan on spending at least ten percent of the original cost of the boat for annual operating and maintenance expenses.

Okay, you've considered all the cost and have established a budget within which you can work. Now you need to find a boat. There are plenty around, but which one should you choose?

Hull Design

One of the most important factors to consider at this point is hull design. Each design has certain performance characteristics. By comparing the advantages and limitations of these hull designs, one can find the hull most suited for his needs.

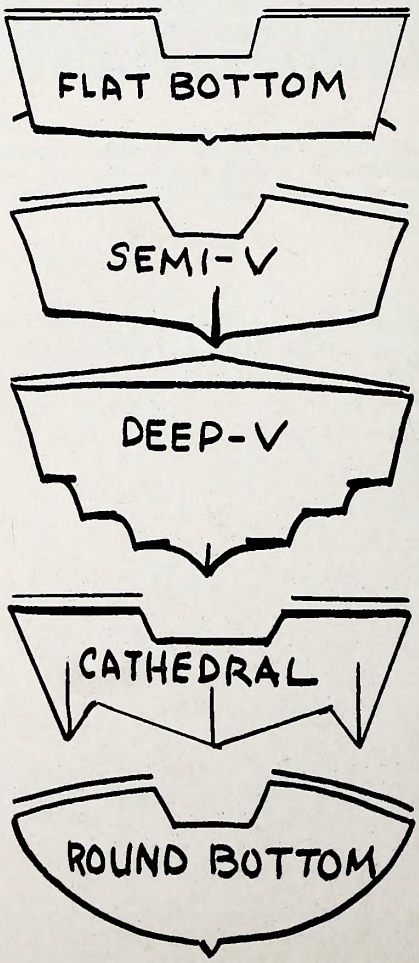
FLAT BOTTOM hulls plane easily and faster speeds can be obtained with them because there is less *wetted surface* or areas of resistance with the water. They are stable and draw less water than V-shaped hulls. Their main drawback is that they pound heavily and produce a rough ride in choppy water.

SEMI-V hulls were designed as a compromise between the fast, steady flat bottom hulls and the slower but softer riding deep-V hulls. They are popular on small and medium size runabouts. While the V-shaped bow cuts into waves at slower speeds and does not pound as bad as a flat bottom hull, it still produces a jarring ride in rough water.

DEEP-V hulls are very popular in large areas of water where choppy or rough water conditions are common. The deep-V hull slices into the waves instead of bouncing over them. This hull shape does require more pwoer than flat bottom boats and draws more water.

CATHEDRAL or tri-hulls offer excellent stability and a cushioned ride on choppy water. This hull design provides plenty of room and is frequently used on boats with the popular bow rider design. While the cathedral hull does give a pounding and sometimes wet ride in rough water, it is a very popular choice among boaters.

ROUND BOTTOM hulls are displacement hulls which are designed to cut through the water rather than planing over it. It is the best hull design for slow speed operation and is used on heavy or slow moving boats such as tugboats, sailboats and canoes. Because it does not perform well at fast speeds and has a tendency to roll, this design is rarely used on modern day runabouts.



"Different boats for different folks." The round displacement hull of the sailboat is designed to move slowly through the water while the light, flat bottom craft (lower) is designed to plane over the surface at a faster speed.

Propulsion System

What type propulsion system is best for the boat? On smaller boats, outboard motors tend to give better fuel economy, weigh less and have a lower initial cost. Outboards do not produce as much torque as inboard/outdrives, and when mounted on larger boats, they consume more fuel than an inboard/outdrive. If an individual goes to twin outboards to match the power of an inboard/outdrive, the initial cost as well as operating costs will be higher. However, many ocean fishermen, who go out of sight of land, prefer the reliability of twin outboards over a single larger outboard motor or an inboard/outdrive.

Inboard/outdrive units have become popular with heavier type cruising boats where the increased power and fuel economy of an inboard are desired but the steering control and tilting ability of an outdrive unit are also wanted. While many feel the inboard/outdrives are more reliable than outboards, others point out the increased danger and occurrence of fires aboard inboard/outdrives.

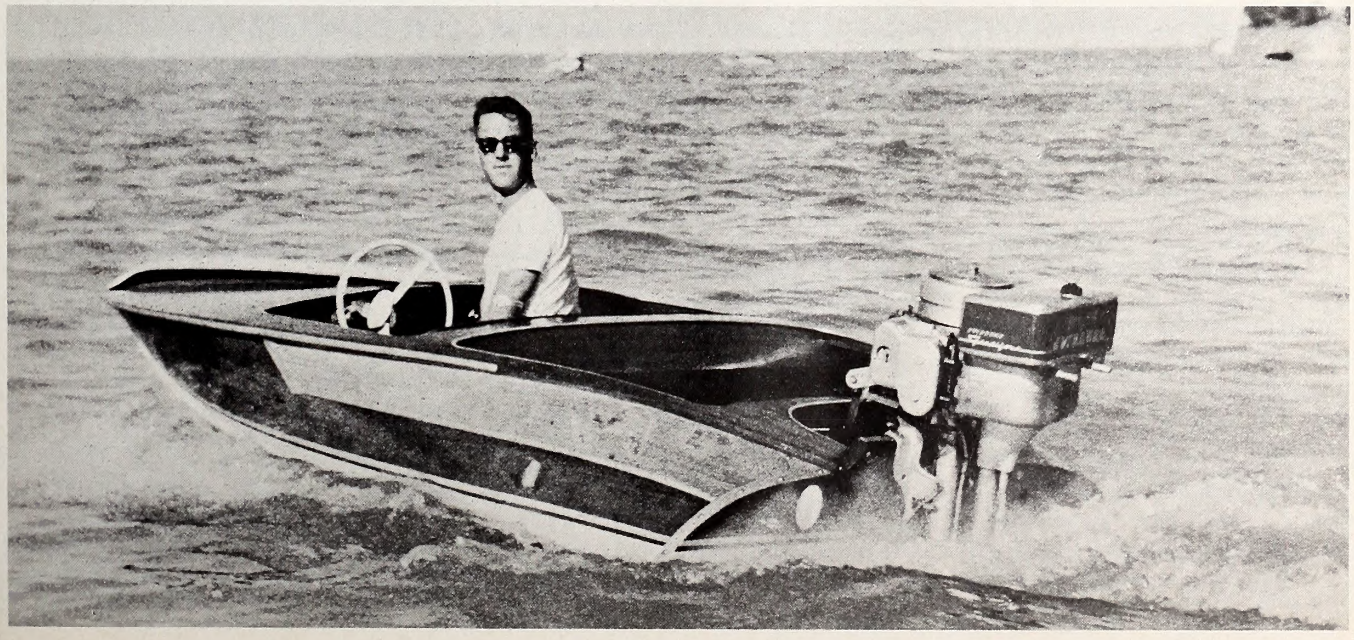
Water jet powered boats are strictly high performance type boats. While they are extremely fast and can be operated in very shallow water, they do not handle well at slow speeds or in rough water. The initial cost and operating expenses for water jets are much higher than outboard and inboard/outdrive powered boats.

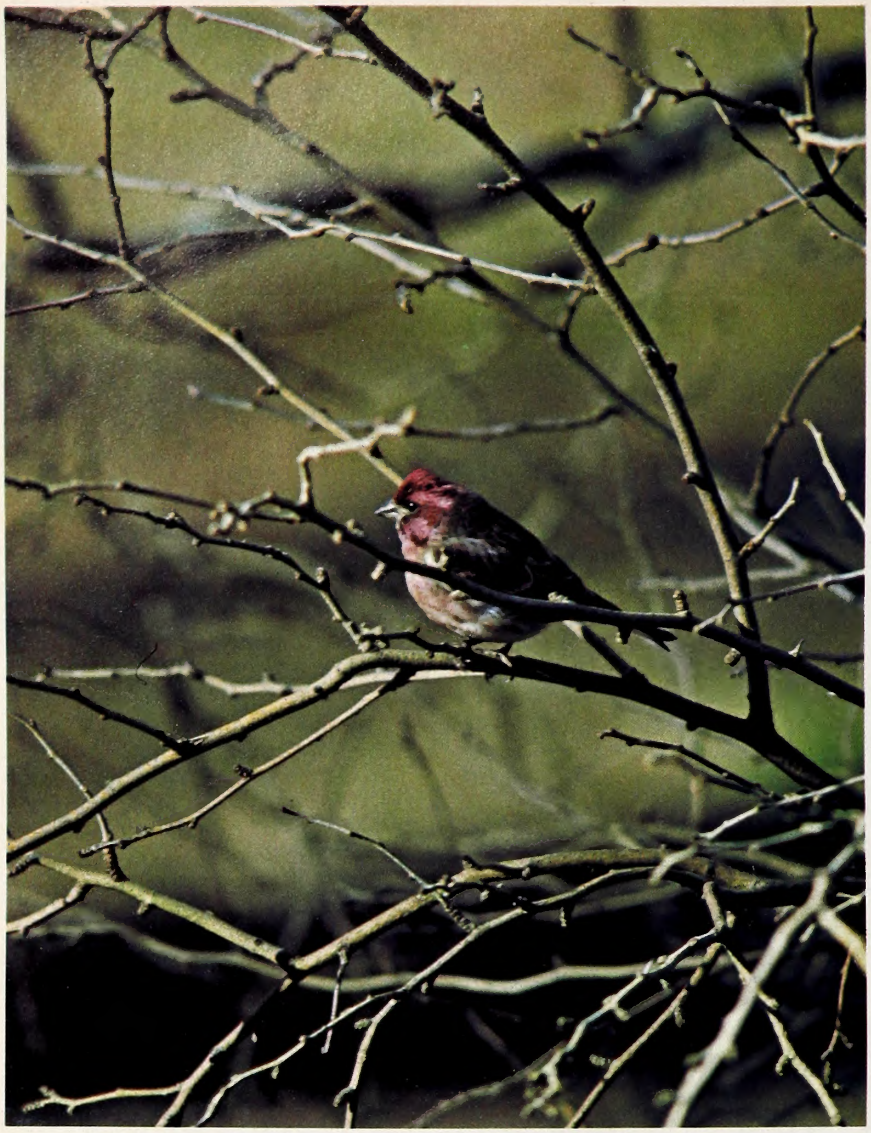
Once you decide what type boat and motor you want, you'll have no trouble in finding it, but look around and compare boats and motors for the best deal. The best deal is not always the cheapest price. Consider quality of the product, the dealer and his reputation. Will he stand behind the equipment he sells? How good is his service department? Is it close to you, or will it involve a substantial trip? Ask your boat-owning friends about the dealer and his product. Satisfied customers are boat dealers best advertisement.

Obviously, there is quite a difference in cost between certain size and model boats and motors. Most of us would like to have the larger, more luxurious models that usually exceed our budgets. If you have made up your mind that you want the larger deluxe model but can't handle the cost, then consider buying a used boat.

In next month's column we'll look into the pro's and con's of buying a used boat. We'll have some tips on what to look for and what to avoid.

Boat and motor designs have drastically changed from this heavy, "wind, pull and hope" outboard and wooden hull. This month's column offers some tips on what to consider when looking for a new boat and motor.





The Purple Finch

by Grace S. Draper
Pleasant Garden

PHOTO BY MIKE BROWNE

No winter visitor from birdland is more welcomed than the vivacious and charming raspberry-colored purple finch. We first see small groups of purple finches in our area (piedmont North Carolina) during the late fall as we hear their unmistakable "tick" call note in the treetops, with the real invasion usually occurring after the first of the year. Then it is that the evening grosbeaks (which in recent years have become more and more populous in North Carolina during the winter months) join the purple finches and cardinals to rapidly deplete our feeders of sunflower seeds!

We have discovered that an added attraction for them at our farm is the small masses of wild coralberries (which bear the imposing name of *Symphoricarpos orbiculatus*) around the edges of the woods and fields. This shrubby plant has little cranberry-red berries clustered densely along the plant stems which remain after the leaves fall. As cold weather and freezing temperatures persist, the berries gradually turn a mulberry color and by mid-January attract berry-eating birds of all kinds by the dozens. Among these are flocks of purple finches; the handsome males perfectly match the berries in color. The birds will suddenly fly down from the trees, alight on the delicate branches, and pluck off the berries one by one. Within a few weeks, all the berries have disappeared from the bushes. This plant therefore serves a vital purpose in supplying necessary food for wildlife at a very critical time of winter. (See "Wildlife in North Carolina" November, '76, page 18.)

Small coralberry thickets spring up around the bases of trees where birds have dropped seeds, or on edges of woodlands or fields, especially in poor soil. Underground runners are sent out which in turn send up shoots to make a thick, mass growth attractive to low-nesting birds in the summer, such as field and chipping sparrows; the yellow-breasted chat nested one summer in a clump of coralberries near our barn. Bees completely cover the bushes at blooming time in mid-summer.

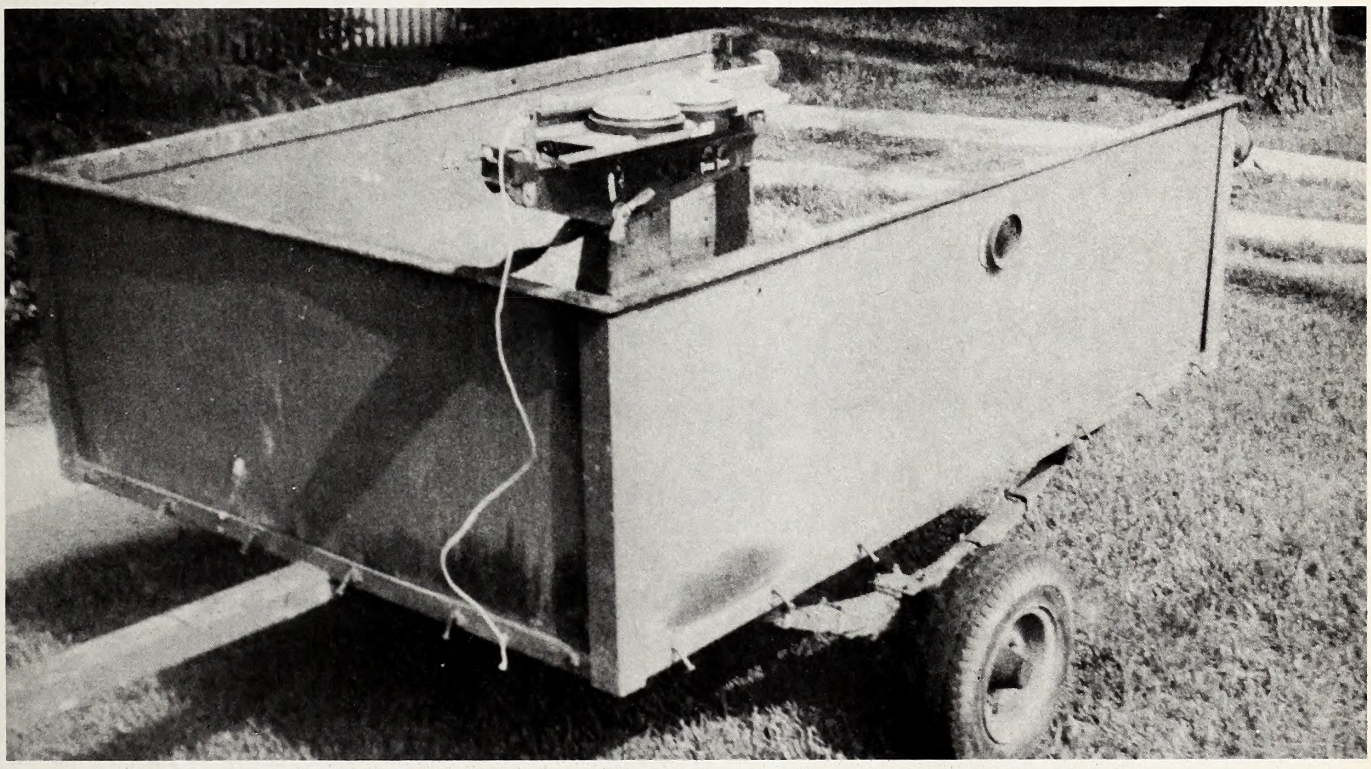
The purple finch belongs to the seed-eating family *Fringillidae,* to which the colorful cardinal, grosbeaks, buntings, dickcissel, redpoll, goldfinch and red crossbill also belong, as well as the many sparrows. It comes to us from summers in the evergreen forests of the northern and Pacific states and Canada where it feeds on berries and wild fruit as well as grass and weed seeds. It is the state bird of New Hampshire.

It is the male who flaunts the lovely raspberry-colored feathers; his mate looks somewhat like a sparrow and is often confused with various sparrows, with brown and white streaked plumage. When the birds are disturbed or angered by other birds, a tiny pointed crest of feathers will erupt atop their heads.

In late spring, we will hear a sweet warbling song coming from the treetops that can be identified with no other little bird but the purple finch and we know this is a signal that they soon will be winging northward. This bird is one of the last of our winter visitors to leave; on into late April and even early May we will see a welcome straggler or two, but suddenly one day we sadly realize that all are gone until winter comes again!

Mobile Skeet-
Off-Season Eye Sharpener

by **William G. Murray**
Norfolk, Va.



• A shooting friend and I have come up with an idea to keep our shooting eye sharp all year round with what we call **Mobile Skeet.** We have owned a Trius Double Trap for some time and have always kept it out back of his motel where it was convenient to step out and try to powder a few clay pigeons whenever we had the time and were so inclined. The only drawback there, we sort of had to pick our shooting schedules, since not all of his guests could take in stride the idea of having to listen to a barrage of gunfire, especially when they were trying to take a noon-day siesta.

So we started thinking how much better it would be if we could have the trap mounted on a vehicle and take it with us when we were scouting the countryside in the summer and fall, on the lookout for likely looking bean and corn fields that would afford us the type of shooting dear to our hearts — quail and dove. There are numerous field paths and easily accessible country roads leading to the farms located in the area where we live — spots where we can shoot without endangering livestock or disturbing anyone.

We have a small utility trailer, built sturdily with a steel frame — approximately four feet wide, five feet long and about three feet high, made to order to transport our double dog coop which we load on when we are going to spend the day afield. We hit upon the idea of welding the trap to the top of the frame, up front — that way it would not take up any trailer space and the elevation of the trap is ideal for the loader as it is waist to chest high on a man of average height. The trailer is easily maneuvered and we can use either my friend's pickup or any car with a trailer hitch.

We find we can get all angle shots — crossing, quartering, going away, as well as high incoming shots — using a few simple safety precautions as far as position of the shooter in relation to anyone loading the trap, of course. We have had a lot of pleasure in the short time we have had this setup, as well as the enthusiastic participation of some of our other shooting companions that we have invited along on our little excursions. ◆

- Letters
- Comments
- This & That

BACK OF THE BOOK

New officers elected at the Wildlife Resources Commission's January 24 meeting are Roy A. Huneycutt (center) of Locust, Chairman; V. E. "Pete" Wilson, III (left) of Rocky Mount, Vice Chairman; and Dewey W. Wells of Camden, Secretary.

NEWSPAPER FOR SPORTSMEN

Sportsmen, particularly in eastern North Carolina, now have their own monthly newspaper. The "Carolina Outdoor News" has been around for awhile now—you may have seen it in tackle shops—and it's been growing steadily.

The idea, according to editors Walter Ramsey, Jr., and John Daigle, is to give hunters and fishermen up-to-date local news and articles about outdoor sports.

Daigle, who recently visited the offices of WILDLIFE IN NORTH CAROLINA, indicated that he's looking for experienced sportsmen across the State to contribute regular news items of local interest to the paper.

Subscriptions are available for $3 a year by writing Carolina Outdoor News, PO Box 1067, Kinston, NC 28501.

Turkey Fever

A letter from my sister, Mrs. Earl G. Scott, of Wolf Summit, West Virginia, was so interesting that I asked her permission to share it with outdoor enthusiasts.

Mabel did not title the story, but I feel that *"Turkey Fever"* would be a good caption for it. It took place several years ago.

This is the second wild turkey that my sister has bagged. She has been hunting since she was "knee-high to a duck." I well remember seeing her take our father's old dilapidated 12-gauge shotgun out squirrel hunting. He was afraid it would break down but Mabel never feared it. She usually got her squirrels, too. But now to the story.

"We went to our camp in Pocahontas County but only stayed five days. I just couldn't take it. I didn't feel like going, but Earl said maybe the mountain air would make me feel better; I said I couldn't do much hunting but maybe I could go out in the woods and sit on a rock. Well, that's just what I was doing one evening; it was so nice and quiet one could have heard a pin drop.

Then I heard a lot of noise in the dry leaves. It sounded like a party of hunters walking toward me. I kept looking and listening, trying to see where they were. Then the noise stopped and I looked out to my right, and there, behind a little rise, I saw a large flock of wild turkeys. All I could see was their heads and necks. Well you can bet I didn't waste any time getting my gun to my shoulder.

As soon as I shot, I stood up and saw that I had got one. I was really surprised because a turkey's head isn't a very large target, and their heads are continually doddling. Well that turkey really did some

KNOW YOUR ENFORCEMENT OFFICER

Randy R. Barker

Randy R. Barker, Enforcement Officer I, was born January 30, 1949, in Marion, Virginia. The son of Mr. and Mrs. Ray Barker of Wilkesboro, N. C., Randy graduated from Wilkes Central High School in Wilkesboro and Gaston Community College in Gastonia.

Officer Barker completed Basic Recruit School for Wildlife Officers in January 1974. He was employed May 16, 1974, and was stationed in Robbinsville as wildlife officer trainee. On September 1, 1974, Barker was appointed wildlife officer and was stationed at Otto, N. C. He has attended the basic nine-week training school at the Institute of Government.

Randy is a member of the N. C. Association of Wildlife Enforcement Officers and the Southeastern Association of Game and Fish Commissioners. He is married to the former Rebeca Huie of North Wilkesboro and they have one son, Matthew, age two years.

ENFORCEMENT RECORD FOR DECEMBER, 1976

HUNTING AND FISHING

Persons Checked	22,313
Total Prosecutions	1,276
Total Convictions	1,122
Total Fines Collected .	$21,994.00
Total Costs Collected . .	$23,662.50

BOATING

Boats Checked	406
Total Prosecutions	154
Total Convictions	134
Total Fines Collected . .	$ 719.00
Total Costs Collected . .	$3,271.50

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

tall jumping and flapping! It went clear to the bottom of the mountain and me right after it! I was afraid if I didn't keep my eyes on it I wouldn't be able to find it when it stopped. The sun had almost gone down and it was shady in the woods, so I stumbled over logs and through briars and brush. Then it finally stopped. It was a nice young one, weighing 11½ pounds.

"Then I had to go back up the mountain to get a squirrel which I had shot about an hour before. I had left it by the rock where I was sitting. Maybe you think I wasn't exhausted!

"Then I started to the car. I had to hold the turkey high to keep its head from dragging on the ground. I had the gun and squirrel in one hand and the turkey in the other, and would have to stop and switch hands every few minutes.

"If I had been feeling well and hadn't been so weak it wouldn't have been such a job. I finally took it by the legs and put it on my back. I told Earl I felt like an old pioneer coming through the woods with that turkey on my back; but it was a lot easier to carry that way. When I dressed the turkey I couldn't save the neck. Its head and neck were riddled with shot.

"I thought that the car would be parked where Earl had let me out, but he had gone a quarter mile away and parked. I unlocked the rear of the car and put my turkey in, thinking I would surprise Earl. But he was hunting not far from the car and heard me close the trunk lid, so the first thing he said was, 'Well I want to see your turkey!' He said he knew I wouldn't bother about putting any small game in the trunk.

"I guess I was pretty lucky to get that turkey. I didn't suppose I'd ever get another one. It was rather a thrill, if it was just a little bit too much exercise for the way I was feeling. But I wasn't about to lose that turkey!"

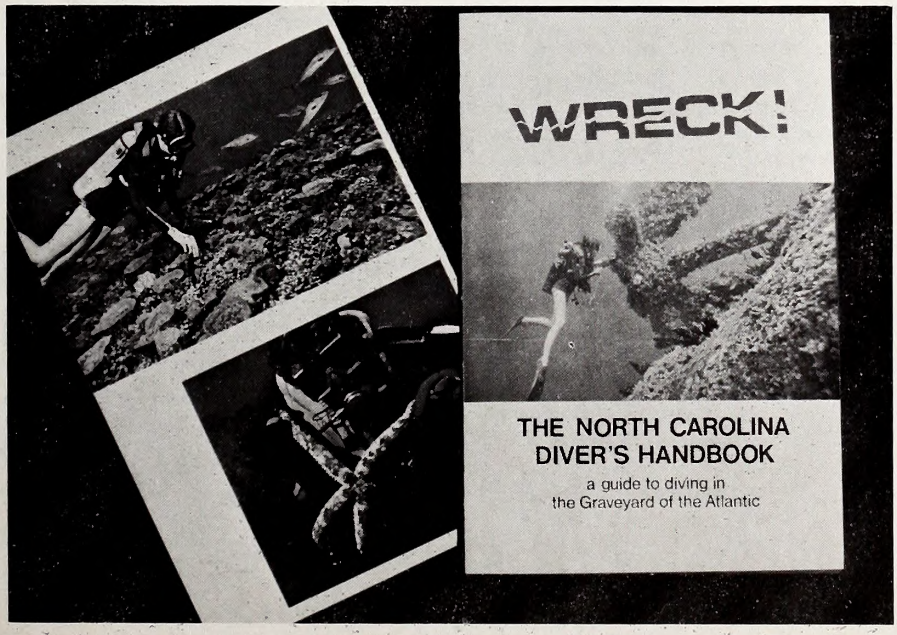
By O. Afton Linger
as narrated by
Mrs. Earl D. (Mabel) Scott

Book Reviews

Marine Grafics, Box 2242, Chapel Hill, N.C. 27514, has produced a new book entitled "Wreck!" designed to assist the diver in finding the numerous sunken vessels off the North Carolina coast. The 76-page book deals with the history of the Graveyard of the Atlantic, facilities such as dive shops, charter boats, etc. which serve this area, plus detailed information on the various wrecks with how-to-get-there instructions.

The cost is $4.50 (which includes shipping) and it is available from pro-dive shops and directly from the publishers.

Southern Living Magazine has produced an interesting and very practical cookbook entitled "Southern Country Cookbook." It has some genuine southern recipes which you may not find in print elsewhere. A section on game cookery contains many fine examples of how to prepare tasty wild meats and fish. The last quoted price was $9.95 plus $.75 postage. It is available from Oxmoor House, P.O. Box 2463, Birmingham Alabama, 35202. It may be at your local book store, too.



Road Kill

Dear Sir:

On December of 1975, my grandson and I were riding down to Long Beach, N. C. We saw so many animals, etc. that had been run over on the highway that we decided to keep a list for the year of 1976.

We traveled a total of 5,479 miles. Below is the list.

Birds	23
Buzzard	1
Chickens	2
Cats	21
Raccoons	22
Deer	2
Dogs	9
Ducks	1
Egrets	1
Foxes	1
Hawks	1
Muskrat	1
Opossums	176
Otter	1
Owls	2
Quail	3
Rabbits	34
Squirrels	25
Skunk	1
Snakes	21
Turkeys	1
Turtles	5
Wharf rat	1

Yours truly,
(Mrs.) Virginia McClure
Elizabethtown

Turkey Folks Gather

The North Carolina Chapter of the National Wild Turkey Federation will hold its Second Annual Banquet and Calling Contest March 12 at the Western Alamance High School, five miles north of Burlington. Registration for the calling con-

test is scheduled for 1 p.m. with the contest (open to North Carolina residents only) itself getting underway at 1:30. An auction of wildlife prints, hunting equipment and other items is slated immediately after the contest.

The banquet will be held at 5:30 p.m. Cost is $12 per couple, $7 per adult and $5 per child. Holders of banquet tickets will be eligible for the door prize, a Remington Model 1100 12 gauge shotgun.

National Wildlife Week

"We *All* Need Clean Water" will be the theme for the 40th Annual National Wildlife Week, March 20-26. (See photo opposite page)

More than 10 million students, teachers, and members of state and local conservation groups are expected to participate in the week-long, nationwide observance, according to G. Ray Arnett, president of the National Wildlife Federation.

NWF, whose 3.5 million members make it the nation's largest conservation education organization, sponsors National Wildlife Week every year in conjunction with its 50 state affiliates. Wildlife Week information kits have been mailed to 189,000 teachers, nationwide.

"We chose clean water as the focus for this year's observance," Arnett said, "because this is a pivotal year in our long struggle to clean up the nation's waterways. We have a July 1, 1977, deadline coming up for all industries that discharge wastes into navigable waters. It requires them to apply the best practicable control technology available before discharging their wastes and we want to make sure that there is no rollback or relaxation of the new standards."

The 1977 Wildlife Week poster (see back cover) shows three Alaskan brown bears—a mother and two cubs—prospecting for salmon in a rushing stream. More than 700,000 of them have been printed and the poster has been reproduced on 7 million stickers.

• WHITE PINES from page 9

terrestrial flatworm. There is a large, introduced, tropical species, *Bipalium kewense,* which occurs in greenhouses and gardens throughout the state (*Wildlife,* July, 1975), but native land planarians are rarely discovered. None has ever been recorded from the Piedmont before, and only two species are known from the mountains, mostly above 3,000 feet. The "White Pines" flatworm was discovered beneath thick, matted leaf litter in a small gully in one of the ravines. It resembled a small slug in general appearance, but revealed its true identity when crawling. Extended, it was only about an inch long, considerably shorter than *Bipalium,* and was uniformly light gray dorsally with a white underside. Unfortunately, the single specimen was immature and precise identification was impossible, although it is believed to be a different species from those in the mountains. Further efforts are planned to secure mature, identifiable individuals.

Thus, the "White Pines" harbors at least one unusual animal in addition to its distinctive floral composition, and is truly a unique area to the Piedmont. However, human activity has already reduced the size to less than 1½ square miles. A large part of the portion in Chatham County may already have been destroyed, as suggested by a solitary, dead white pine on a local resident's property, one mile west of the present limit. In Lee County, logging has destroyed much of the eastern edge of the stand.

Bleak Future?

It is time to preserve the remains of this unique area as a living example of the geological and climatic processes that shape the face of our land. Natural Area status would seem desirable to avoid the large numbers of people attracted to places of greater recreational potential. Whatever its eventual status, the existence of this serenely beautiful area should be insured for future generations. If the "White Pines" is gradually destroyed, the loss will be final. ⬍

• PETS from page 12

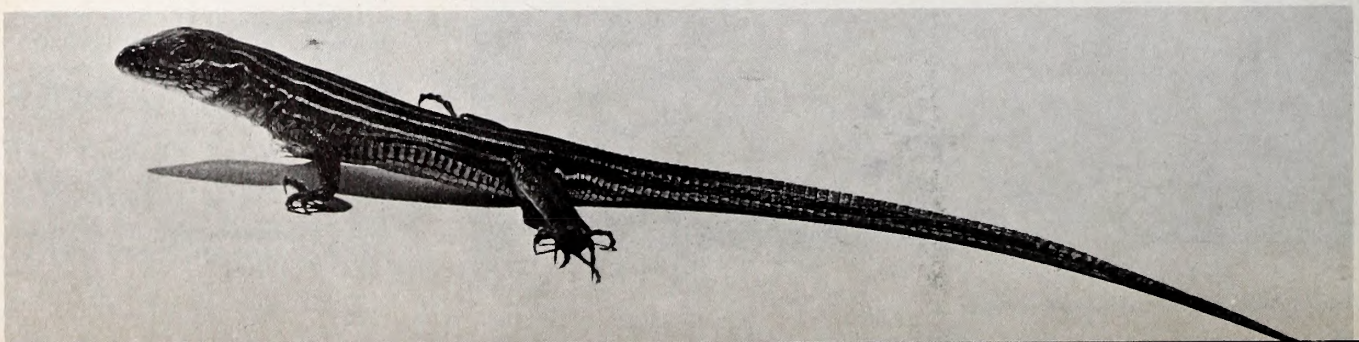
Like last November when my youngest boy, Charlie B., came down from upstairs proudly holding a green snake he said he found under his bed. Well, my wife now believe the house is infested with snakes—and she may be right!

Recently, my oldest son, David, invested in a catalog which offers all sorts of exotic things, such as duck-billed platypuses, boa constrictors, Tasmanian devils, elephants, man-eating tigers, cobras, lions, and other such creatures. He is fascinated, and is now saving his money for the price and postage of something huge to pasture in the backyard. A rhino would be different in Nashville, Tennessee, wouldn't it? Yet David explained that the dog wouldn't bother something like this. I'll bet it wouldn't!

There are rewards, however minor, of such juvenile endeavors. I have a friend who, on occasion, takes a drink—or several. He dropped in not long ago, glowing beautifully, when I saw him go pale and fix his eyes on the mantel. There, staring at him, was Mr. Ig, the iguana, long and green and plumb horrible in appearance. Replete in his prehistoric regalia, he was something straight out of "The Lost Weekend." It ruined my friend's entire evening; in fact, he went home, drank milk and watched TV.

But the pet shop sent me a Christmas card—they should have, since I have the feeling that I have contributed mightly to their livelihood for the past several years—and it seems they wanted to thank me for my patronage. Accompanying the card was a small notice to watch for their special ad.

I didn't, but would you believe that they have a new kind of lizard from some far away land which has never before been imported into this country? Yes, I'd believe it; I've just been told! ⬍



WE ALL NEED
CLEAN WATER
ATIONAL WILDLIFE WEEK • MARCH 20-26 1977
JOIN AND SUPPORT THE NATIONAL WILDLIFE FEDERATION AND STATE AFFILIATES

PHOTO BY LUTHER PARTIN

Early Bird

Mourning doves nest very early, and some broods are already in the flimsy nests.

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VOL. 41, NO. 4 APRIL, 1977

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Jim Dean ..... Assistant Editor
Luther Partin ..... Writer-Photographer
Ted Dossett ..... Writer-Photographer
Curtis Wooten ..... Writer-Photographer

Sooner or later one of these gobblers will assert his authority and the complexion of this peaceful scene may change. The two hens at far left will seek nesting sites in protective cover and the gobblers will go their separate ways. Painting by Duane Raver, courtesy of Henry L. Kitchin, Wadesboro.

Photo By Joel Arrington

TROUT TIME

Matching the Batch

by
The Rev. William H. Privette
Asst. Rector, St. John's Episcopal Church,
Fayetteville, N. C.

THE trouble with trout fishing today, is that there is more than one way of doing it. For many decades there have been two schools of strategy, the purist's method and the bait fisherman's way. With the advance of modern technology and its influence upon fishing tackle and techniques, it would not surprise me to see some angler in the near future using a depth sounder attached to his fly vest as he wades a stream in search for rainbow, brown, or brook trout! Heaven forbid it!

Every season the trout stream is visited by all sorts of folks, using all sorts of tackle. More and more it is becoming difficult to distinguish a trout fisherman from a bass buster. Spinning rods and corn, ultra-light rods (fairy wands) and hardware, cane poles and red worms, fly rods with assorted lines, leaders, and flies, bait casting rods with bass plugs; you name it and it has been tried on trout. What I am leading up to is that the rivalry which was once cherished between the bait fisherman and the fly flinger is diminishing rapidly. Due to the influx of different tackle and procedures, the traditional goal of catching trout by the purist methods of fine leaders and flies tied to match the hatch, has been replaced by the all important goal of bringing something home for supper, no matter how you can catch it. Even I, a purist at heart, a flinger of flies, have succumbed to such pressure to a certain degree. To illustrate the point, I have a story to tell.

Before moving to Fayetteville from the mountains I had grown up in and become attached to, I planned one more fly fishing trip to a favorite nearby stream. I invited two neophytes as sort of a ritual passing on of secret places. One fellow was from Louisiana, the other from Texas. Neither had fished for trout much but were full of curiosity and interest.

We left my house early that morning, stopping only once to have breakfast at a diner along the way. We arrived at Hemlock Creek in time to watch the morning mist rise from the water. At the trunk of my car we stood, putting on our waders, vests, creels, and such. I then noticed the tackle. The Louisiana Kid had brought a fairly husky spinning rod. He intended to catch some big trout on that rig, especially since he planned to use corn, red worms, spoon plugs, cheese, and spinners for bait. The Texas Dude pulled out another husky rig with much the same in the way of tackle and bait. To tell the truth I was embarrassed to retrieve my fly rod from the trunk so I compromised by bringing forth my ultra-light fairy wand and a handful of small, delicate spinners. I had hoped the crappie would forgive me for such a choice, not to mention the great W's, Walton and Wulff.

We departed down the trail toward the stream. It had been a year since I had fished here and yet the stream was reminiscent of many untouched days long ago. This would be my last trip to Hemlock Creek for a long time and I wanted desperately to catch some

There may be times when any of us will succumb to using just about any legal method to catch trout. But there are few methods that top fly fishing. The perfect cast, the right float, and the precise strike . . . these add up to the nice rainbow pictured on the opposite page.

PHOTOS BY JIM DEAN

Lots of fishermen won't agree with this style of trout fishing, and in some North Carolina waters (Trophy and Native streams) it's not legal. But it is an effective method, like it or not.

trout. You might say that my eyes and ears took everything in, the beauty, the gurgling sounds, the songbirds and trees, everything that made this place unique—for the last time. I had to absorb as much of the surroundings as possible for memory's sake. To say the least, I was in mourning and fresh trout for supper would help my grief.

At the base of the bridge we separated, each with his own destination and all of us with the same purpose, to catch trout. I began to fish upstream as usual, casting to each spot that looked promising. My spinner would reach out to those rocks and ripples, plopping up beside those big logs that reached out to change the direction of the flow. It was not long until I had a fish on and in the net; one of those logs had produced a fine rainbow. As I looked at it, admiring its beauty in my hand, I realized that this one had grown up in the stream. Its coloration was brilliant, with solid pink covering even its gill plates in splendor. Its dorsal fin was fully developed, not battered and stubby from fighting other fish in the hatchery's ponds. As I slipped it into my creel, I wondered how my comrades were doing. But only for a moment; then I was on my way, wading upstream and casting once more.

I commenced to catch a few more keepers for the frying pan and then decided to return to the bridge to check up on the other fellows. As I arrived I noticed that Ed was in vigil over a small pool. He was hiding behind a bush, casting away with his spinning rig. I slipped over to him to get a better look for myself. Within the confines of a mediocre pool, lay seven large trout, finning leisurely and paying no attention whatsoever to Ed's spinner. Time and time again Ed would cast the length of the pool, retrieving his flashing delight before the scrutiny of each fish. And yet, not one trout seemed to be the least bit interested. I began to rise to the challenge. Surely there was a way!

I suggested to Ed that he change his methods. These large trout were stockies, so give them some corn. Ed changed to a No. 8 hook. Reaching into his bag, he brought forth a handful of the Jolly Green Giant's pride and joy, Niblets brand corn. He baited the hook and cast. Again to our surprise, there was no response. He could have thrown a bomb in there and the fish would have ignored the explosion. Not to be outdone, I suggested that he chum the pool. Ed threw in a handful of corn, sprinkling it on top of those trout. It had an effect. The magnificent seven began to swirl and knife through the kernels, as if it were the old days back in the hatchery raceways. While they were busy sucking up every bit of corn, Ed plopped his baited hook into the midst of the activity. We watched and waited with apprehension. The water was perfectly clear and we could see all of the action. Each trout would run for the bait with full speed. Each trout would turn at the last minute, deciding not to take the hook.

As I left the pool, headed for the car trunk, Ed was continuing to chum and try. The rainbows would suck up every bit of corn but that on Ed's hook. At least we had them active now. But I don't know what is more frustrating, having them

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Wayne Talks Turkey

by Frank Mooney

ILLUSTRATION BY DUANE RAVER

THE fading moon gave off a faint glow, bathing everything in a yellow hue as the eerie cries of whip-poor-wills heralded in the clear, spring morning. I was walking beside Wayne Bailey, a turkey expert and a legend in his own time. Wayne spent 25 years working with the West Virginia Department of Game before coming to North Carolina as turkey biologist in July of 1970.

This was a special day for me, we were in an area where prescouting had proven that turkeys were present and hopefully a boss gobbler would make the forest ring with his lusty call of love. And with Wayne in my corner, I felt we could get on with the program should a gobbler show any sign of wanting attention. Wayne had already bagged an 18 pounder on opening morning of the 1975-76 spring season after dueling with it for 45 minutes.

We paused temporarily beneath some towering pines to await daylight. Dawn is a magical time of day for me with the excitement a little more breathtaking during gobbler season. As day began to break, birds began to chirp from the branches and crows started their early patrol for food, with their constant cawing, while keeping a vigil for any late moving owl to harass. At this time of day one can often see the mourning dove winging overhead in the predawn light.

Wayne gave out with a series of clucks that any turkey hen would envy and a gobbler sounded off instantly on the ridge below us. Nothing warms the heart like the first gobble before dawn. We moved in and spread out about 100 yards apart. Then another tom began to serenade us and I felt lucky indeed to be hearing these exciting sounds.

We continued to sit in silence as the two gobblers told the surrounding world that this was where it all was and not to interfere. Around sunup both gobblers hushed up; then suddenly a loud gobble rang out behind me in the open pasture

near the place Wayne had called from. I was in the dry leaves afraid to move. Why had the two gobblers suddenly hushed?

The old monarch continued to strut and gobble. I expected to hear Wayne fire at any moment. That old bird was really wound up. I heard a turkey fly to a large tree between us but due to thick brush I was unable to see it. By then I figured perhaps some other hunters had spooked the two gobblers. Was I in for a surprise?

Wayne's 12 gauge sounded like a cannon in the morning stilless. In a few minutes he called me. "That dang bird was within 30 feet of me but the brush between us was too thick to penetrate. I saw only his head and neck so I'm sure it was a clean miss. That was the largest bird I have seen in some time."

As Wayne continued to talk, the story unfolded about the mystery of the two gobblers. Much to my surprise one of the toms flew a hundred yards or more from its roosting tree to the open pasture beyond where Wayne was sitting, then proceeded to strut and gobble near a herd of beef cattle before moving over the hill. The other tom (which was the bird I heard fly) followed the first bird.

My problem was like the old turkey hunter's sad tale; I sat down wrong. The place Wayne told me to hide was so thick that I couldn't see any distance and I felt it was too thick for a gobbler to walk through. Those two toms flew almost overhead where I first started to wait but changed my mind. Well, better days, I told myself while mentally kicking my backside. Days like this come frequently during the spring season.

In a couple of days Wayne was suppose to meet Frank Piper, President of Penn's Woods Products at the Charlotte Airport then rendezvous with Harold Herman, Harry Wilfong and myself at Harold's cabin to hunt turkeys in the western part of the state. Frank Piper brought along Don Redinger, photographer, to film a movie on turkey restoration and turkey hunting. Don was an experienced photographer, he had filmed much footage in Africa. The movie would cover scenes in North Carolina, West Virginia, Pennsylvania, Vermont and possibly Virginia.

I arrived at the cabin on the 19th of April around 9 p.m. They had hunted that day but without any luck. Before we turned in for the night, I talked Frank and Harold into giving a short practice session with their diaphragm calls. They were both great. I almost swallowed one before putting it aside; at least I wouldn't have to worry about swallowing my box call.

Three-thirty a.m. came early and we hurried to dress and eat breakfast before starting the long drive up the mountain. Frank, Don, Harold and Harry would hunt near the restoration area where turkeys had been released earlier while Wayne and I hunted the surrounding slopes in hopes the turkey population had spread or some native birds inhabited the steep ridges.

Wayne had already killed his two birds for the season, so to him this was strictly work. Those two birds had made his 88th and 89th wild turkey. The morning was a bust for Wayne and me but the other hunters heard six gobblers. Frank Piper called in two birds that morning but failed to score due to camera noise while filming a bird that came within 20 yards and the standing cameraman spooked the other bird. Harold called in a bird that slipped up from behind and made a hasty retreat ahead of a load of high-brass No. 4 shot.

That night Frank Piper roosted a gobbler but next moring the bird failed to make the scene. The turkey must have left the tree during the night since he was not observed the next morning leaving the tree. Wayne told us that turkeys will leave a roost tree during the night and that he had roosted 27 turkeys in Pennsylvania one night in the same area and left without alarming them. He returned the next morning before light and was able to see only four or five fly down.

The next day was a carbon copy for me, not a single gobble echoed up and down the tree-covered slopes. The weather was unseasonably warm and those long sleeve camouflage clothes kept us steaming under the collar; also following in the wake of Wayne Bailey will fog up anybody's glasses! I accused Wayne of learning to pace with a quarter horse when he stopped crawling and started to walk. His height and extremely long step gives him the edge over medium height hunters.

My vacation was over so this finished the hunt for me in Western North Carolina.

Would the turkey hunter who spooked the gobbler from the roost tree last season by the continous yelps then making a noisy, hasty retreat for the truck within minutes after it flew down the ridge, while I sat concealed beneath a pine tree, please listen. Once the tom answers your yelps or clucks from the roost tree don't call anymore until it flies down. It knows your exact location. More yelps will only prevent it from flying down quickly, plus making it suspicious that something is amiss. No male likes a female that talks too much . . .

After a couple of hours in the blind, this turkey hunter surveys the surroundings atop an old sawdust pile. Action was a bit slow this spring morning.

PHOTO BY TED DOSSETT

The Case for "Motorless" Roads

by J. N. Weakly[1]
and
Harry B. Wilfong[2]

PHOTOS BY J. N. WEAKLY

NUMEROUS newspaper and magazine accounts point to significant increase in the human use of federal and state parks, forests and recreation areas. In some cases, such use has been sufficient to prompt federal agencies to consider further restrictions to limit the impact. The increased desire to use public lands for a variety of recreational purposes—hiking, outdoor education, picnicking, fishing and hunting, motorcycling, jeep touring, etc. — is evident also on our state- and federally-owned lands in North Carolina which are primarily managed for wildlife.

Particularly disturbing is the volume of traffic by off-road recreational units such as trail cycles and four-wheel drive vehicles at critical times of the year. Those of us who have a concern for wildlife and a familiarity with the U. S. Forest Service and Wildlife Resources Commission holdings which comprise the North Carolina Game Lands system are aware of this increased use and are concerned about the adverse effects of it.

In the opinion of many, there is at present an excessive number of open access roads into public lands in North Carolina. The high degree of vehicular use associated with access is of special concern to those interested in improving the future status of game animals such as the bear and wild turkey and of such non-game species as the eagle. The North Carolina Chapter of The National Wild Turkey Federation feels that the status of the wild turkey and other animals as well would be greatly improved by the strategic closure to motorized vehicles of carefully selected portions of the elaborate "side road system" which now exists.

1 President, North Carolina Chapter, The National Wild Turkey Federation

2 Vice-President North Carolina Chapter, The National Wild Turkey Federation; past-President, North Carolina Wildlife Federation

At the outset, it should be emphasized that we are not proposing that anyone be barred from entering property in the game lands system. Our suggestion is that public access by motor vehicles be replaced with access by foot travel in certain game lands or key portions thereof. Certain roads would be gated and the road beds seeded in grasses. Such "motorless" roads would provide beautiful foot trails and still remain usable by vehicles under special or emergency conditions. Our proposal is not intended to restrict authorized Wildlife and Forest Service personnel in the performance of their duties, nor is it intended to be so rigid as to exclude the possibility of temporarily opening a closed area if this be determined to be a useful wildlife management tool. For example, temporary access could be reestablished during the deer season in an area having an overabundance of deer.

Rather, the purpose of this article is to make a case for supporting the closure of carefully selected side roads where sensitive and valuable species such as the wild turkey have been established and where the animal's status might be improved by such closure, or where littering and habitat destruction resulting from excessive vehicular usage is a recognized problem. Many of our neighboring states (Virginia, West Virginia, Pennsylvania) have long had "gated road" policies on lands they control. The Pennsylvania Game Commission owns over 1,000,000 acres of game lands and nearly all of the larger tracts are managed under a limited access policy. Professional wildlife personnel in Pennsylvania attribute game abundance there, at least in part, to the "gated road" policy.

The benefits of a wisely and carefully managed "gated road" policy

This is a road, but it is one on which motor vehicles are prohibited . . .

would be many, some of the most obvious of which are purely economic. Restriction of motorized access would conserve gasoline and reduce the costs of maintaining the system. Almost everyone complains about the high cost of government; here is a policy which would reduce it.

Littering would be reduced along with the likelihood of other forms of vandalism including man-made forest fires. Erosion, enhanced by the continued vehicular use of the road, would be reduced, resulting in cleaner, clearer, and more productive streams in some watersheds. Selected road closures would also result in a reduction in the size of areas needing frequent patrol by enforcement personnel, hence protection of other areas, including private properties, could be intensified.

The establishment of foot trails to replace existing roads would benefit health by encouraging walking rather than driving. Walking is a form of exercise almost universally recognized as being beneficial. Concern has been expressed that if portions of our game lands were open only to foot travel, the aged or physically handicapped hunter or fisherman would be denied the

. . . but this one shows the severe problems that can result from vehicles.

right to participate in his sport. However, we are advocating a **reduction, not an abolition,** of access roads. There will always be an adequate number of roads for those who cannot travel afoot or who choose not to do so.

Our foremost concern is, of course, the wild turkey. There are several ways in which a reduction in vehicular access might be expected to benefit the wild turkey specifically. Certainly one of the greatest benefits of road closures would be a reduction in the illegal game kill. As discussed in an earlier article in **Wildlife in North Carolina** (October, 1976), illegal hunting represents one of the greatest threats to the wild turkey. A poacher doesn't want to carry illegally killed game over long distances or along well-traveled public roads bordering the game lands. Therefore, it stands to reason that the less opportunity he has of driving into a remote area to make a kill near his vehicle, the less likely it is that he will take the risk. A reduction in illegal turkey hunting would be particularly important in insuring the success of the small, struggling populations which have been moved to new areas of the state as part of the wild turkey restoration program.

There is ample reason to expect that the reduction in disturbance which would accompany limiting the degree of motor traffic would be highly beneficial to the wild turkey. Although turkeys are known to tolerate normal farming operations and certain other human activities as long as they are unmolested, wild turkeys are in general relatively intolerant of man and his activities. Studies in West Virginia in the late 1960s concluded that as a rule, the turkey populations there were inversely proportional to the disturbance associated with an extensive access road system:

> "A fairly elaborate system of roads is requisite to any timber management program and can be detrimental or beneficial to the turkey population. A forest road seeded to grasses and legumes provides excellent brood range as well as free foods in winter. Frequent human disturbance will, however, nullify the area as brood range and the easier access may increase the turkey harvest, illegal or legal, to dangerous levels. Nowhere in West Virginia is there a thriving turkey population where roads open to public vehicular travel exceeds 15 miles per 10,000 acres and the best populations occur on areas with less than six miles of open roads per 10,000 acres. It is essential that human disturbance be limited on roads and trails in excess of 15 miles per 10,000 acres."[3]

Other studies pointing to the disturbing effects of human activity on wild turkey populations have been reported from Alabama, Florida, Kentucky, and Pennsylvania. The adverse effect of excessive vehicular traffic is likely to be particularly damaging on small wildlife management units where too much activity could push the birds from protected areas onto adjacent range which affords poorer food sources and offers little or no protection from illegal hunting.

The establishment of walk-in areas in lieu of roads on our national forest- and state-game lands would enhance the aesthetic value of the hunting experience. In order to accept this, one must first accept the notion that the goal of hunting goes past the simple collection of game. Those of us who hunt have experienced wonderful days afield even when we didn't see any legal game or fire a shot. These days are memorable and treasured because we learned something about the life style of an animal and about the relation between the animal and its environment—**ethology** and **ecology** are the terms used today. We may have come away with no game on the belt, but we did not come away empty-handed. This intimate association with nature was made possible because we got out and into direct contact with nature. It's the kind of experience that one doesn't get sitting in a four-wheel drive vehicle trying to locate game by listening to the CB radio.

In addition, whether we are willing to accept it or not, we must face the fact that society's view of sport hunting is gradually changing and will continue to change as the growing human population competes for available space and as more people are raised without the chance to experience hunting conducted in proper perspective. Some approaches to hunting are going to hasten the demise of the sport as we have known it. Those methods which emphasize respect for nature by encouraging intimate contact between man and his environment will help to preserve the sport; those methods which emphasize the use of new, sophisticated equipment simply to improve the kill rate will not.

We feel that the true sportsman owes it to himself and to his sport to advocate and support methods which preserve the idea of hunting as a total ecological experience rather than a method by which the most modern and efficient techniques are used to kill animals. Modern technology, if permitted to develop without restraint, probably has the capability of making every hunter 100 percent successful at every outing. As long ago as 1949, Aldo Leopold — hunter, conservationist, and brilliant scholar—admonished us. ". . . [to] shrink the role of gadgets in the pursuit of wild things." By establishing more walk-in areas and by resisting the desire by some to make access readily available, we will be preserving the opportunity for the intimate contact with nature which has in the past allowed us to develop an awareness and respect for

• **continued on page 27**

3 Bailey, R. W. & Rinell, K. T. (1968). History and management of the wild turkey in West Virginia. West Virginia Dept. Natural Resources. Bull. 6, 59 pp.

Crow Calling - A Springtime Challenge

by Charles M. Rucker

Tools of the crow calling trade: it's not so much what you use as it is how you use it. Some good callers simply use their mouth rather than calls of the types shown here.

IT was June the eighteenth. The sun was high and indistinct through the mid-morning haze. Already there was a heavy stillness in the air. This day was going to be hot.

It was good to be with my friend Macon, and as he drove I could see how the kudzu had overrun the abandoned farm houses, junked cars, ravines, and anything else that couldn't get out of the path of its inexorable creep.

Occasionally the delicate scent of honeysuckle would rush into the car and then fade like the perfume of a passing lady.

The world was now past the stage of dogwood blossoms and robins' eggs; but rather had taken on the profuse green lushness of absolute summer in the South.

Far ahead of us the highway shimmered with heat waves and the mysterious silver mirages on the asphalt would disappear when we got too close.

We passed little country stores with tin roofs and front porches. Usually there would be a spreading oak somewhere near by with an old bench or chairs in the shade it provided. Predictably, cigarette butts and bottle caps—by the hundreds would be scattered about in all directions. These trees have seen farmers, mechanics, lumbermen by the generations come and go.

The green and white state highway signs bid us farewell from one county and welcomed us to the next. It wasn't unusual to see one that had been punctured by rifle holes.

Sometimes a light breeze would ripple through a field of rusty wheat but most of it stood straight up and still.

Several hundred yards away a great oak tree, dead and sun-bleached rose much higher than the pines which surrounded it. Perched on its highest branch was a very large bird with broad shoulders. It had that powerful, athletic symmetry which belongs to all birds of prey. I couldn't tell if it was a hawk or an owl.

A stone chimney leaned alone in the middle of a plowed red field. The furrows bent politely to accommodate this structure, then became more radical with each lessening circuit. It was easy to see that the tiller had done it many times before. It would have been very simple for a man with a tractor to tear it down and plant the ground on which it stood. That chimney was left for a reason. Land around here was often kept in the same family for many years. Family graveyards, abandoned homesteads, and certain old trees believed to have been planted by kindred ancestors were considered almost sacred. And they were defended as such. And more than one farmer has turned over soil that holds the salt of his grandfather's sweat.

Macon turned left onto a dirt road. The ride was bumpy. There were ridges in it several inches apart, and when we rode over them with any speed, a rhythmic and punishing vibration was set up. During its most violent interval, I could even hear the spare tire and jack bouncing in the trunk. My father once called these "corduroy" roads. I couldn't think of a better name. Finally it was all over and the road smoothed out. Orange dust rose and swirled in our wake.

From the right, a small dirt road led down to two tobacco barns. It was eroded badly so that there was nothing to it except washed round boulders and the little potholes behind each one where the water had pounded after cascading over them. It's always strange to see the effects of a storm which occurred long ago.

Macon pulled off to the side of the road. He said that he knew the landowner and had his permission to shoot.

After leaving the car, we walked toward the barns. It was too rough to try and drive. On both sides of us grasshoppers jumped from the tall grass and flew short distances making that dry, buzzing sound. We could hear the muffled chirping of a nest of young birds inside the barn. Passing the second one, we entered the woods and crossed a small creek. It was noisy walking on the dry leaves and dead branches. Several hundred yards later we found some young trees which looked good. I knelt down and Macon went a few feet further and did the same thing. He was obscured by a small cedar, but I

Bringing the sharp-eyed and suspicious crows within range is largely a matter of skill and patience.

A .22 rifle brings a whole new element into crow hunting. Some hunters actually stalk the birds from heavy cover. Be extremely careful with the long-range rifle.

could hear the mechanical sliding and clicking his automatic made when it was being loaded. Soon he leaned back and nodded to me, signaling that he was ready. I put the call to my lips and began.

First, I gave some long extended strokes hoping to reach distant birds. Then I worked into short growls much like those made by crows when they find an owl. I then stopped to listen for the fruits of my effort. Sure enough, a crow called back and I thought we were in business. I blew several times more to give our exact location. But something was wrong. He was responding to us, but wasn't getting any louder. The devil had lit in a tree just out of range. And when a crow has been alerted, there's no such thing as sneaking up on one. He was interested, but afraid to come any closer. I would call, then he would answer. I would call again, then he would reply. After several minutes, I realized that this could extend on into the evening. With this obstinate crow, I took much pleasure in ending the conversation with a highly unnatural toot from the call which sent him flapping quickly out of sight.

Soon there was the mechanical sound of Macon's automatic. It was being unloaded. I stood up, then he did. Macon wiped his forehead with his sleeve. Pointing to the ground, he said, "These birds have been shot at before." Nestled in loose pine needles were three bright red shells. They were high-brass No. 6's.

We walked out of the woods, past the barns, and down the washed-out road. Macon didn't have much to say. It was always disappointing to go to all the effort and be rewarded with an educated crow.

We laid the empty shotguns on the back seat. It was very hot inside the car and I wasted no time in rolling my window down.

A big horsefly had gotten inside and was busy punishing himself on the rear window. It is very rare and somehow enjoyable to see a horsefly uncomfortable. The sound of his frantic buzzing brought back all the times that I've been bitten by them while swimming in our pond. As a boy, I tried to elude them by taking a deep breath and swimming underwater as far as I could. When I surfaced, sometimes all would be quiet and I would know that I had succeeded. But on others the dreaded circular buzzing would start again and I would be found in short order.

Macon suggested that we stop at the next country store that we saw. It sounded good. The sun was high and shadows were small. The back of my shirt stuck to the seat.

We drove to the end of the dirt road and turned left onto the black, smooth asphalt. The tires made a hum which rose higher with acceleration, then finally disappeared altogether.

Within a mile, Elmo's Cash and Carry approached on the left. We pulled in and parked the car in the shade. On the front porch laid a drowsy dog with skin loose enough to be at least part bloodhound. His head conformed to the floor like a half-melted scoop of ice cream. Even when we walked past he never raised, but rather followed us with thoughtful eyes. The screen door slammed behind us and the old planks creaked with our weight. Inside were all the things which characterize a country store. The slowly rotating overhead fan and a black pot-bellied stove stuffed with cartons and newspaper, its blistered pipe bent at right angles and projecting through the ceiling.

Macon handed me a drink. It was very cold and the bottle was wet. On the walls were calendars with pretty girls on them which were put out by the fertilizer and auto parts dealers. You see, Macon was

married and I often cautioned him about looking at the calendars too long.

Strips of brown fly paper hung from the ceiling in spiraled curls.

I asked the gentleman behind the counter if that was his dog on the porch. He answered, "That's Jud. He don't belong to nobody. Besides, he don't do nothin' but breathe."

In the corner nearest the cash register and in easy reach stood the ever-present shotgun which every country store operator has hidden somewhere.

We finished our drinks and put the empty bottles in a partitioned wooden crate. At the counter while paying, I could see neat stacks of merchandise which were seldom seen in the city. Steerhide gloves for heavy work, rifle ammunition, strong tractor wrenches. There were handy little canisters of snuff with fascinating and sensuous names . . . Navy, Peach, Society. Next to it and responsible for the bulge in every farmer's cheek, was the chewing tobacco. Cut into exact and densely packed rectangular blocks, they proudly displayed their brand as if there were grave differences between each one . . . Red Man, Day's Pay, Black Maria.

The owner took our money and the cash register opened with a ring. Turning, we walked toward the porch. Macon pushed the screen door open and it closed behind me with a slam.

Old Jud hadn't moved. His thoughtful eyes followed us down the wooden stairs. I stopped briefly and studied the animal. In a soft wistfulness I asked, "What's a dog like that good for?" But by now Macon was sitting in the car and hadn't heard me. I followed and the engine started.

It felt good to sit down. The seat wasn't hot and when we got back on the highway a refreshing cool breeze swept through the car. I was looking forward to the next stand. The tires hummed.

WITHIN five minutes we came up on an old country church. It was wooden with a stone foundation. A small belfry was built onto the roof and bees rushed in and out between its slats. There was a cemetery in the rear. Honeysuckle had adorned some of the markers but had completely ingested others.

We got out and took our shotguns off the back seat. Passing by the chapel, we could plainly hear the fierce drone of the bees. We walked quickly.

Tall broomstraw swayed with the wind as we tramped through the graveyard. There stood the simple service crosses of the soldiers, the little headstones with lambs and Bible passages for the children, and the old grey slabs which leaned and couldn't be read. Beyond there was a very nice trail which led through the field and into the woods.

We hid in the high grasses at the far end of the field. It felt good to take the heavy shell belt off and drop it on the ground. I loaded my pumpgun with three shells and Macon was busy doing the same with his automatic.

After drawing a deep breath, I began calling. This time I began slowly and worked into a distress frenzy, like that which would be made by a mother crow whose young were being attacked. I blew long and hard. Finally it was time to listen.

I could barely hear the tiny reply of a distant crow. But I could tell by his tone that he meant it and was determined to find us. Long seconds passed.

At last a large shadow swept across the ground in front of us and an irate crow catapulted through the pines ready to fight. Macon raised his gun and followed him briefly. Then the automatic spoke. The crow's wings folded up in mid-stroke, and fell cleanly to the earth like a tattered black umbrella. One crow, one shot. An act so simple and yet so complete has its own meaning. It was an experience for us both to be proud of.

Macon walked to his bird and picked it up. We trudged through the field toward the church. Upon arrival at the car, Macon laid his open gun across the hood and lit a cigarette. He examined his bird closely. It was a truly beautiful one. It was so black that it reflected an iridescent blue-purple from the sun.

Our guns were already unloaded and we put them on the back seat with actions open.

I noticed that the wind had gotten stronger and cooler. A large elm tree was rustling and its leaves showed their silvery undersides. Dark formidable clouds were rolling in. This day was going to end with a storm like so many really hot summer afternoons do in the Carolinas.

We got into the car and backed away from the church.

The first raindrops tapped randomly on metal and glass. Many more followed until a deafening clatter was achieved. On my window I watched a single drop run its frantic and erratic course down the glass.

Pulling onto the highway we headed for home.

I have had many fine days in the woods alone and with friends. And in fact, their recollections have brought me warmth for years later. If something is good enough, it's never lost. Many times have I laid in bed, too restless to sleep, and thought back on past crow shoots.

There were those stands where everything was perfect — no wind, no glare, and I was far from the road. I called my best and afterwards would listen hard for the faint reply of at least one crow. But the only sound would be the buzzing of deerflies circling my head.

But then, equally astonishing, would be the other kind. The most foolhardy, half-cocked attempts which paid off; like the time I blew twice on the call while leaning out the window of Macon's Buick. In less time than it took to stop the car, get out, and load a pumpgun, at least two dozen crows circled not 30 yards from his silver Electra. It was insane. We got four outright and there would have been others if we hadn't been laughing so hard at a situation that "couldn't happen."

These memories are the kind that I like to fall asleep on. A good friend, big woods, an old Winchester, and Monday two glorious days away.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

HUNTING Regulations Hearings

Without going into embarrassing details of mislabeling the HUNTING AND TRAPPING Regulations hearings in last month's Resource-O-Gram, here are the dates and locations of the public hearings to discuss the hunting and trapping regulations which will go into effect August 1, 1977: (all begin at 7:30 p.m.).

April 4, 1977	Courthouse	Edenton
April 5, 1977	Courthouse	Jacksonville
April 6, 1977	Courthouse	Nashville
April 7, 1977	Courthouse	Elizabethtown
April 8, 1977	Courthouse	Graham
April 12, 1977	Courthouse	Sylva
April 13, 1977	Collett Street Recreation Center	Morganton
April 14, 1977	Courthouse	Yadkinville
April 15, 1977	Central Elementary School	Albemarle

One Last Hunting Season for This Year

The North Carolina wild turkey season (bearded turkeys only) is as follows: April 9-30 in and east of Rockingham, Forsyth, Yadkin, Iredell, Catawba, Lincoln and Gaston counties. Gates County is closed by local law. April 16-May 7 in and west of Stokes, Surry, Wilkes, Alexander, Caldwell, Burke and Cleveland counties. Bag limits: Daily 1; possession, 2; season, 2. Dogs may not be used to hunt wild turkey. A special big game license is required in addition to the regular hunting license; all turkey must be tagged as soon as they are killed and reported to a Wildlife Cooperator Agent.

New Wildlife

Spring means a new crop of wildlife. The young of most species will be coming along within the next few months and need all the help they can get. Keep the family dog and cat from roaming, don't molest young wildlife and don't pick them up and try to "raise" them. It's an almost impossible task and it is illegal.

Boating Season

Be sure that your boat is properly registered, numbered and equipped before it is launched. For more information, write: Division of Boating, Wildlife Commission, 325 N. Salisbury Street, Raleigh, N.C. 27611.

Animal Track Photography

Linville River

Goldenrod

Reliving Your Outdoor Experiences

• Have you ever sat beside a mountain trout stream and watched the clear water flow over massive boulders? Perhaps you have walked along such a stream, amid towering pines and cedars in a valley that followed a winding route between majestic mountains, or your vacations may have been spent along pebble-strewn beaches, where each high tide brought a fresh array of seashells and driftwood to be collected.

You no doubt will recall the beauty of these and other outdoor scenes in future years, but time has a way of fading even the most vivid scenes from the mind, unless you record these memories on film.

Not only could the outdoor vistas be recorded, but every day events like Bobby catching his first trout and mother attempting to keep the tent from blowing away while dad searches frantically for more rope and stakes, should be a mainstay in the family photo album.

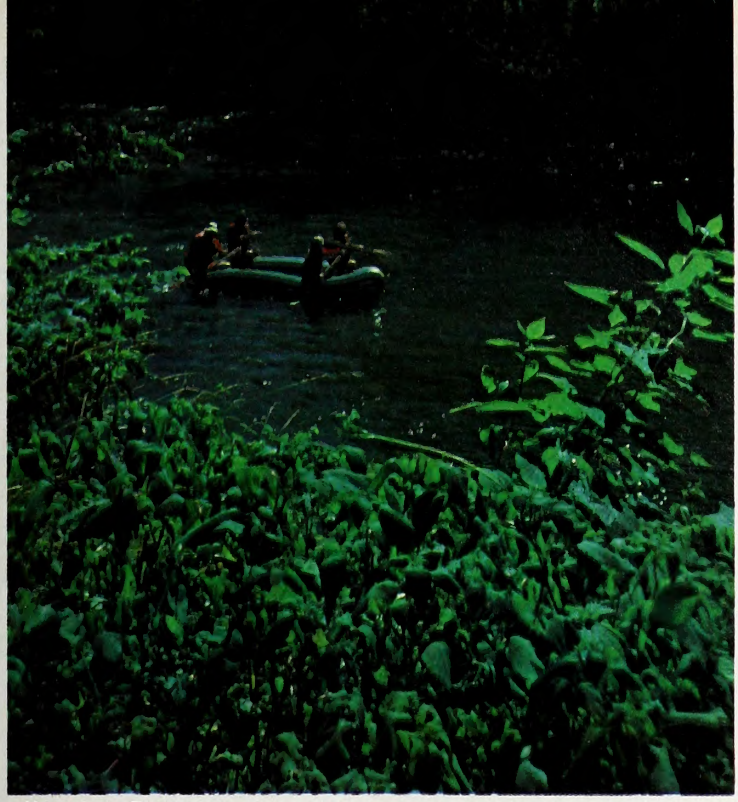
Because everyone sees different things in the outdoors, photography can be fun for the entire family. Dad may want to record the events of a deer hunt. The first buck that his friend shot is important, but so is the cutting off of the shirt tail from his brother-in-law's new red shirt for missing an easy shot. Mom sees beauty in wild flowers and mushrooms, while most children like song birds and small animals.

Family photography need not be, nor should not be, complicated. Cameras have progressed from the complex to the simple in the past decade. Most of the simple "Instamatic" type cameras on the market can be loaded and used by preschool children. Simple cameras are now priced within anyone's budget. It is far better to buy small individual cameras for each member of the family, than to buy one high price camera that the children will be forbidden to use.

Most small cameras are capable of taking black and white or color pictures, and the choice is extended to include slides or prints. A simple flash attachment or flashbulbs will increase your success by allowing you to take pictures in low light situations.

Small cameras have the additional advantage of being lightweight. You can carry some models in your pocket, while others are easily carried on a wrist strap.

Ample instructions, usually



Nantahala River

Deer Tracks

Smooth Sumac

Michaux's Lily

included with the camera, will provide you with enough know-how to get good album snapshots. The instruction sheet, packed with all film, will give you additional hints. Easy to read "how-to" books on photography can be bought in any camera shop or bookstore.

Walking into a completely stocked camera store, displaying dozens of brands of cameras, films, filters, tripods and numerous other photographic items, can be a frightening experience for most would-be camera enthusiasts. There is no reason to become confused if you will remember to start with the most basic equipment and then, expand upon your equipment only after you have gained experience.

A weekend drive along the Blue Ridge Parkway will provide a good "shake-down" trip for your new cameras. The key is to take your time and not cover too much distance. Let every member of the family have a chance to photograph whatever appeals to them as individuals.

Typical subjects may include: wildflowers, panoramic scenes from the many overlooks, a group of bike riders or hikers, a canoeist transversing a rapids, small animals and birds, and, of course, your own campsites.

Remember, keeping it simple, taking your time, and taking plenty of pictures will double the pleasure per mile on any outing. And the best part, is that the pleasure can be renewed time and time again for many years to come.

by L. S. Lane

PHOTOS BY L. S. LANE AND L. S. LANE, II

Amanita Muscaria

Stem to Stern

BY ED JENKINS

In last month's column we delved into the subject of buying a new boat. We discussed the advantages and shortcomings of particular hull designs and propulsion units. We also stressed the importance of selecting a boat suitable for one's needs and within one's budget.

Once the "boat bug" bites, that captivating new boat in the dealer's showroom is a tempting item to pass up; however, the discriminating boater who can pass up the lure of a shiny new boat, may find a used boat offers more boat for the money. With the advantages of a lower price tag and a reduced rate of depreciation which comes with a secondhand purchase, there is also a good chance of getting stuck with a "lemon" unless one either deals with a reputable boat dealer or has considerable knowledge of boats and motors.

Generally, boat dealers cannot sell a used boat as cheaply as an individual seller, but dealers usually stand behind their sales and offer some insurance that the used boat and motor purchased will perform as expected. For the wary and knowledgeable buyer who is capable of determining the true condition of a boat and its past use or abuse, the best bargains are usually found from individual sellers.

If the boat being considered for purchase is in the cabin cruiser size range or larger, the services of a professional marine surveyor are not only desired, they are essential. In larger boats, especially wooden ones, faults may be harder to detect and very expensive or impractical to repair. In return for a modest fee, the surveyor will examine the boat from stem to stern and give the prospective buyer an accurate report of the boat's condition.

If you decide to purchase a smaller used boat on your own, you'll first need to know the boat market and current selling prices of new and used boats. This will require some leg work or telephoning boat dealers in your area. Once you have ascertained the market value of the boat, you're ready to inspect the rig.

Give everything close scrutiny on your inspection visit. If the seller takes good care of his home, lawn and automobile, he probably cares for his boat the same way. Try to gauge the seller's expertise as a boater from your conversation with him. As a general rule, the more knowledgeable the boater, the better he will care for his equipment. Inquire about the maintenance and repairs performed. If a local shop did the work, make a mental note to stop by later to verify this and see if anyone has any particular knowledge concerning the condition of the rig.

Take time to carefully inspect the boat. If you like the way it looks and are interested in it, plan on going home, if possible, and sleeping on it, then returning later for another shore inspection. If the second inspection is satisfying, make arrangements with the owner to test the boat on the water. Any unwillingness on the owner's part to let his boat be tested should be considered suspicious.

Inspecting the Boat

Fiberglass is an excellent hull material and holds up well after years of use. Most troubles in fiberglass boats are either caused by sloppy construction or lack of maintenance on the owner's part. To avoid the former problem, stick with boats manufactured by reputable firms. Shortcuts taken by the builder may indicate the quality of his product. Check inside and outside the hull for bubbles in the resin and *hard spots* or flaws which indicate shoddy workmanship. The glass hull should be thick enough to not bulge inward under pressure from your hand. Chopper guns, which mix resin and fiberglass string, may be suitable for use in deck construction, but hulls should be hand lay-up with woven roving and fiberglass cloth for maximum strength. The deck and hull should be bonded together with bolts, or bolts and rivets, not just pop riveted together. Deck hardware and through-hull fittings should be butt blocked with a piece of wood to prevent the nut from grinding away the fiberglass.

The glossy, color-impregnated finish of a fiberglass boat is called the gel coat. If the boat is exposed to the weather for extended periods, the ultraviolet rays of the sun will cause the gel coat to become dull or chalky. Sometimes the new boat luster can be brought out again with an automotive compound. Painting may be required if polishing no longer restores the boat's bright appearance. Surface scratches and hairline cracking in the gel coat are cosmetic and do not hurt the strength of the fiberglass. However, deep scars and cracks could cause problems and should be repaired. Numerous scars and cracks indicate rough usage by the owner.

Water stains on the inside of the hull may indicate a poor bond between hull and deck or just inattention. Examine the transom for any signs of separation of the hull and deck. If an outboard is bolted to the tran-

Problems with used boats are often difficult to discover. A close inspection, inside and out, should help. This month's column offers some tips on what to look for.

PHOTO BY ED JENKINS

som, sealing compound, to keep water from coming in contact with the wood, should be visible around the bolt holes. Plywood seat boxes and storage compartments are susceptible to rot. They, like worn or split upholstery, can be replaced, but such costs should be considered before the boat is purchased.

Aluminum is a very popular building material for flat bottom boats. The heavier the gauge of the aluminum, the better the boat. The main trouble area is the bottom where the ribs running the length of the boat may be worn thin from beaching or sliding in and out of a pickup truck bed. Most dents in the aluminum are harmless, but collisions with sharp rocks or pointed stumps can cause cracks and holes. If an aluminum john boat is used in choppy water, the rivets in the bottom will eventually loosen and begin to leak. Larger aluminum runabouts are subject to dents and punctures but generally hold up well structurally. Repairs are not costly but are time consuming.

Wooden boats require annual maintenance to keep them in shape and suffer from neglect much more readily than other hull materials. Large wooden boats should always be inspected by a marine surveyor before purchase. Small open wooden boats do not require such precaution. A probing fingernail or knife can find rot even under a coat of cover up paint. Plywood boats are subject not only to rot but also delamination. Delamination occurs when the thin sheets of wood bonded together to form the plywood begin to peel away. This problem can be avoided if a good quality marine plywood is used in construction. Fiberglass can also be used to protect the wood from water.

The steering system on boats should be checked for binding and loose cables. Worn steering cables and rusted pulleys will have to be replaced. All electrical equipment and running lights should be tested also.

Inspecting the Engine

If it is economically feasible, the engine should be inspected by an experienced mechanic. When it is not possible to have a mechanic determine the condition of the engine, there are a few items you should pay attention to in your evaluation.

Again as with the boat, the reputation of the manufacturer is important. Consider the age of the engine, running time if recorded and engine use. Lack of use does not necessarily indicate a good buy. If the engine was not properly protected before extended storage periods, the engine can suffer from corrosion in the cylinders, damage to water pump and lower unit, and gummed up carburetor among other things. If the boat was used in salt water, rust and corrosion may cause additional problems.

Consider the overall appearance of the engine. A clean engine usually indicates an engine that has received good treatment. Remove the engine cover and inspect for oil and grease. Examine the powerhead for scorch marks and blistered or burned paint. Engines seldom recover from serious overheating. Replacement is often required. Check wiring and hoses for cracks and taped repairs. A compression check with a p.s.i. gauge can give a good indication of the engine's condition.

The lower unit should be free of excessive corrosion. The skeg and propeller should be examined for bends and nicks. If the propeller wobbles when rotated, it could mean a bent propeller shaft. If practical, drain the lower unit and look for traces of water in the oil which could mean a cracked gear housing. Pieces of metal in the oil indicate worn gears.

Carefully examine the fuel tank and areas around the tank for leaks. Self-contained terneplate fuel tanks (steel coated with a lead-tin alloy) used extensively until recently have a tendency toward corrosion which leads to deterioration and subsequent fuel leaks. If the fuel tank is foamed in place in the deck and cannot be visually inspected, by all means have the tank pressure tested before purchasing the boat.

If the boat you are considering buying has an inboard-outdrive unit, examine the flexible rubber boot located between the outdrive unit and engine for signs of decay and cracking. The tilt mechanism should be examined for signs of corrosion and rust.

The most important step in evaluating an engine is in its operation. Never consider buying a used engine without testing it. The engine should start easily and idle smoothly. Don't accept the owner's excuse that the engine just needs a tune-up. If this is the problem, it should have been done beforehand by the owner to avoid suspicion. Water should come out of the exhaust almost immediately. If water does not come out until the engine is raced, this indicates the water pump needs replacement. The engine should shift easily from forward to reverse without bumping or grinding. Start off at a slow speed and increase the speed gradually to full power. Listen and feel for any missing, unusual noises or vibrations. Check inboard engine for excessive smoking. If there are gauges for the engine, keep check on them. After the engine is well warmed up, check for any water or oil leaks. Stop and restart the engine several times while the engine is warm.

Boat Trailers

If the boating rig you are considering purchasing comes with a boat trailer, hopefully the owner had a marine dealer match the trailer to the boat. In any case, you should examine the boat on the trailer. If pads and rollers do not provide adequate support for the boat, the hull will be exposed to excessive strain and may sag out of shape or crack. The trailer should have its maximum load capacity indicated on the frame. Consider the total weight of boat, motor, gasoline, ice chests and all equipment when determining what size trailer is needed. If that figure is close to or equal to the maximum capacity for the trailer, pick the next larger size.

Galvanized trailers are the best bet in coastal areas where rust can eat away a painted trailer. If the trailer you are considering buying is rusted, it will have to be sanded, primed and painted if it is to last. Check the rollers to see if they turn freely. Some trailers have carpeted skids instead of rollers. Skids are fine for smaller boats, but check the carpet for wear and the wooden skids for rot. Worn winch ropes and cables should be replaced.

If the trailer is wired for lights, check them out. If the lights don't work, it could mean a rewiring job is required.

Unless the trailer wheel hubs are equipped with Bearing Buddies, plan on inspecting, repacking and possibly replacing the wheel bearings. While examining the hubs, inspect the size and condition of the tires. Inquire if a spare wheel comes with the purchase. If it doesn't, plan on spending approximately $30 for one. You'll also need a jack that will fit under the trailer axle. Most automobile jacks won't fit.

A last few words of advice for the prospective buyer: go slowly; examine carefully; and consider everything. "A wise man must be wise before, not after the event."—Epicharmus

BOATING LIABILITY*

by John W. Giles**

FOR most boatmen, a boat provides happy times and much needed relaxation. That's why you take meticulous care of your own boat, and try to make sure she will never be harmed or harm someone else. However, a growing number of boat owners don't share your happy thoughts toward boating because through their own fault or the fault of others, they've been involved in a serious boating accident that has caused them physical harm or mental stress and cost them a good deal of money. In many cases, the accident has been caused by failing to observe common sense precautions or violating a fundamental boating rule to keep a proper lookout. A few court cases resulting from mistakes that others have made illustrate the fact that while boating is usually great fun, a strict observance of common sense rules is necessary to keep it that way.

If your boat is involved in an accident, can you petition the Federal Court to limit your liability under Federal Maritime law? The answer is "No" if the accident occurs out of navigable waters. Two cases in the Federal Courts illustrate this. One involved the owner of a powerboat which struck a water skier on Lake Pleasant, N.Y., a small landlocked lake in the Adirondack Mountains. The other case involved a collision between a cruiser and a 16' outboard on Lake Hickory in North Carolina. In both of these cases, the owners attempted to limit their liability to the value of their respective boats—and in both cases the owners were unsuccessful because the lakes where the accidents happened were found to be non-navigable waters. In a word, you cannot limit your boating liability unless the accident occurred on navigable waters. The courts were of the opinion that the law of limited liability applies to tidewaters, and public lakes and rivers that form by themselves, or by uniting with other waterways a continuous "highway" over which commerce may be carried on with other states or foreign countries, but limited liability doesn't apply to interior lakes without natural ingress or egress to interstate commerce.

When you collide with a pier or any obstruction in the water, the case, if brought to court, usually revolves around the necessity of keeping a proper lookout. In a case in Rhode Island where a floating fish trap was struck by a cruiser, the court found that the fish trap was suitably marked and properly located in a designated fish trap area. The cruiser was liable because of failure to keep a proper lookout and the owner was compelled to pay for the cost of repairs to the trap and damages for loss of its use while it was being repaired.

In an unusual situation in Massachusetts, the owner of a summer resort on a lake near Pittsfield hired a man to take his guests for powerboat rides and provide a tow for water skiers. The employee had a heart condition unknown to the resort proprietor. While approaching a dock for a landing, the employee (boat operator) had a sudden heart attack and died. As a result, the boat struck the dock (owned by a third person) and injured a person who was standing on the dock. The court denied the suit from the injured person saying that it found no negligence in the operation of the boat prior to the fatal heart attack and the evidence did not disclose that the operator was incompetent to operate a boat. However this case is a valuable reminder to you not to lend anyone your boat or employ anyone to operate your boat who has a known heart condition.

You've probably safely piloted your boat under many low bridges, but a Michigan case illustrates the necessity of warning your passengers to keep their heads down while passing under a bridge. In this case, a boat passenger was killed when his head struck a beam of the bridge. His widow sued claiming that the operator of the motorboat was intoxicated and that as he was going under the bridge, he swung the boat to starboard, causing the port side of the boat to rise out of the water, thus causing the injury. But the other passengers testified that the deceased

This boat operator may not mean any harm (and it does make an interesting picture), but dangerous attention-getting antics such as this, may cost a swimmer his life and saddle the operator with an enormous lawsuit.

* (Reprinted from August, 1976 BOATING magazine.
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**John Warren Giles is a lawyer and member of the Bar in New York, Chicago, and Washington, D. C.—Editor

passenger stood up suddenly, and this was the cause of his death. The jury found no negligence in the operation of the boat and hence no liability, but the operator still had to endure the hassle of a court case.

You probably know that sailboats have the right of way over boats under power, but you might not know that swimmers and downed water skiers also have the same right of way. If you strike and injure a swimmer, you are in for trouble.

A case in California illustrates the necessity of exercising great care in picking up water skiers in the water. This is not and should not be a performance for inexperienced boat operators. In the case (the names are fictitious), Mr. and Mrs. Smith took Mr. Jones and his wife water skiing in the Smith's newly acquired 16′ outboard. The first day of skiing passed uneventfully. On the second day however, the two men decided to water ski in tandem, so neither was able to drive the boat. They persuaded Mrs. Smith to drive. Because she hadn't ever driven this boat before (although she had driven other boats), and had never driven a boat while towing or retrieving skiers, her husband instructed her for about 30 to 40 minutes in the operation of the boat and in the proper techniques required in towing a skier and retrieving a downed skier.

Mrs. Smith successfully drove the boat towing the two men for about half an hour. Then they dropped their tow lines and waited in the water, some 300 feet apart, for Mrs. Smith to circle and pick them up. She first drove to where Mr. Smith was waiting, but he wanted to ski some more and told her to pick up Jones. The testimony as to what followed was highly conflicting, but it's clear that when the boat was within a few feet of Mr. Jones, Mrs. Jones, who was riding in the rear of the boat, screamed, and at about the same time, Mrs. Smith turned the boat hard to starboard causing the stern of the boat to swing left towards Jones. The stern passed over Jones who simultaneously attempted to dive under the boat. He didn't make it because of the large, vest-type life preserver that he was wearing; he was struck by the propeller of the outboard motor and sustained serious injuries to his left arm. The case went to the Supreme Court of California and that court ruled in favor of Mr. Jones.

NUMEROUS cases show the importance of giving swimmers a wide berth. In a Michigan case, a swimmer's leg was struck by a boat and outboard propeller. The evidence showed that the defendant drove the boat where he knew there were bathers. Worse, the bow was tilted upward so that he couldn't see ahead, and a girl was lying on the bow looking back and talking to him while he drove the boat around making sharp turns. The jury found him liable—he had violated a Michigan statute that states a boat should not be operated in a reckless manner so as to endanger life or property.

In Utah, the operator of a boat was held liable for striking a girl skiing behind another boat, about a minute after she'd been dislodged from her skis and fallen into the water. In West Virginia, a plaintiff won a case in which he was struck while water skiing by the propeller of the defendant's following boat.

One of the many causes of accidents today is the failure of a larger boat to slow down and make sure that her wake will not swamp a passing smaller boat. The rule on this has been set out clearly in a Federal case in Florida where the wake of a cruiser so rocked a passing outboard that one of the passengers was thrown from his seat and severely injured. The judge's decision stated that a vessel causing injury to another by her wake must be held responsible, and her operator is required to take all reasonable precautions to avoid injury to other boats, even though former experience has shown that in the usual course of events they are likely to escape injury. Smaller boats have the right to assume that larger boats are aware of their presence and will observe reasonable precautions, and they do not have to warn the larger vessel of the danger. So always be careful to slow down when passing smaller boats.

Another Florida case illustrates the danger of taking someone out in rough water in a small boat. In this case, a hotel guest had his back broken when rough seas threw him into the air and he came down on the seat in an open 14′ flat-bottomed boat that he was bone fishing in with a hotel guide. The guest had never been on the ocean in a small boat before, and he won substantial damages.

In a Federal case in Arkansas, the operator of a boat permitted a guest who claimed to be experienced to drive the boat. After he took the helm, the guest suddenly pulled the throttle-gear lever from forward to reverse, throwing a girl riding on the rear deck into the water where the propeller struck and permanently injured her leg. The result was that the injured girl sued and received a judgment for $84,000, which made it quite an expensive boating afternoon. The guest, who was operating the boat with the permission of the owner's son, was found to be slightly intoxicated. This case emphasizes the great danger of allowing anyone to

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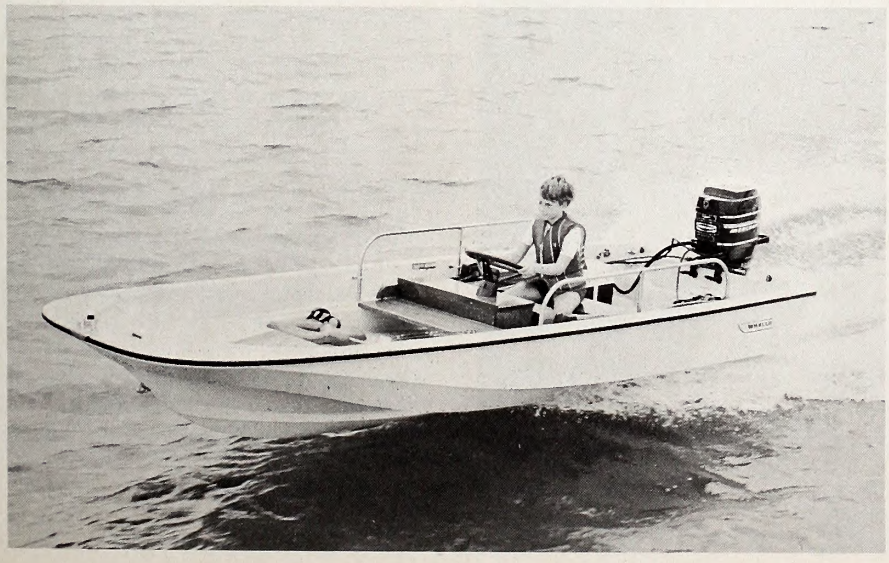
While many youngsters are responsible boat operators, parents should realize that they are liable for any damage caused by their child's recklessness or negligence before they give junior a free rein.



Try for Caswell Turkeys

by **Durwin Elliott**
Deep Gap

MY experience with turkeys actually started several years ago, but prior to the 1976 season, I had only seen two turkeys, and I was sure that only one of those was a gobbler. The more I read and heard about turkey hunting, the more engrossed I became; shortly after the 1975 season, I firmly decided that the next year would be the one in which I bagged one of those elusive woodland kings.

I talked to as many people as I could about turkeys and where the majority of them might be found in North Carolina. I read everything I could obtain pertaining to hunting the wild turkey. I decided that the Caswell Game Land would be my best bet since there seemed to be several turkeys on this game land, and, like the other game lands, it is open to public hunting.

I am 25 years old, and I teach science at Watauga High School in Boone, North Carolina. I live at Deep Gap, a three hour drive from Yanceyville; this presented a minor problem as far as scouting was concerned, but immediately after grouse season, I started heading toward Caswell County every weekend to look for turkey sign.

I really didn't know what to look for, but I finally stumbled upon a creek bottom just full of large turkey tracks. Not far away was an overgrown field that must have been the tribal meeting ground for turkeys from all over, considering the amount of feathers and droppings I found. I knew I would be close by on opening morning.

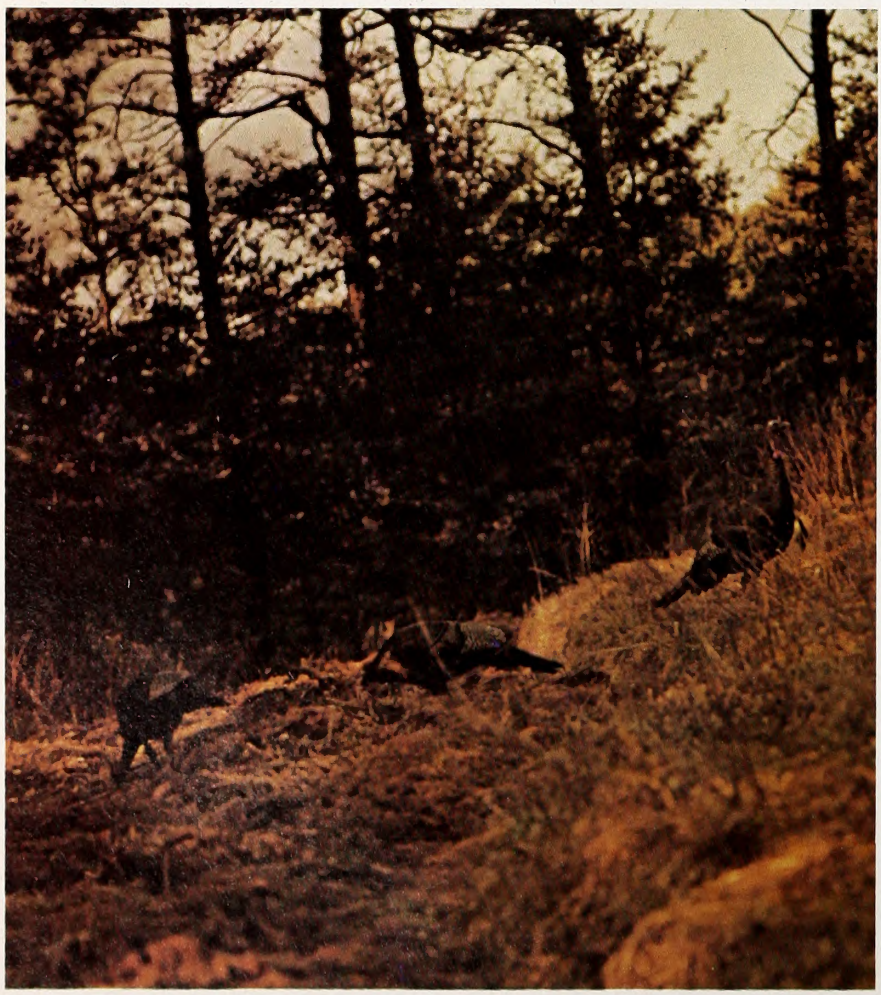
During the next several weeks, as soon as the students left for home, the halls reverberated with the sound of yelps, clucks, whines, and various other kinds of turkey talk. Of the variety of calls I had obtained, I decided on two—a Burnham Brothers box call and a Harold Knight tube diaphragm—as being the best.

School finally came to a close on Friday, April 9, the day before the opening of turkey season, and I left Boone heading for Caswell County. The three hour drive didn't seem to be nearly that long as I thought about the large gobbler I would be dueling in the morning. I arrived about 6 o'clock that evening and started to erect my tent when another turkey hunter invited me to sleep in his camper for the night. I accepted, and, in so doing, met a fine gentleman. He had bagged several turkeys in his hunting career. The way he could make that Lynch Box talk, I'm surprised he didn't have all the turkeys in the woods right there in our camp. His last name was Fine, and if he reads this, I sure hope he bagged his turkey.

I don't think I slept any; I checked the alarm every few minutes to make sure it hadn't gone off for some unexplained reason, causing me to oversleep. Finally 4 a.m. arrived, and I turned the alarm off before it had time to ring and awaken Mr. Fine. We quickly cooked a breakfast of ham and eggs, put on camouflage, including headnet and gloves, and went our separate ways toward our chosen location.

I arrived and parked the pickup well before daylight. About 30 minutes later, I was at my stand—a large stump on the ridge leading from the field to the creek. At 5:55 a.m. I heard it; to me the most exciting sound in all of nature—gobble-gobble-gobble—the passionate love cry of a mature tom turkey.

He was farther away than I had



Wild turkeys are seldom seen far from protective cover. These are alertly picking their way along the edge of pine woods in early morning light.

PHOTO BY LUTHER PARTIN

anticipated. I tried to get closer without making a sound, but the dry leaves wouldn't cooperate. I finally reached a position about 150 yards from him with a suitable stand. I just prayed that he had not heard me. As if to answer my prayer, he gobbled again, and I knew so far so good. I eased out my box and sent forth two sleepy clucks. Almost at the same instant, I heard several yelps coming from about 150 yards on the other side of the turkey. The gobbler didn't answer, and I didn't know whether I had heard a hen turkey or another hunter. I just sat still and waited. About a minute later, another series of yelps came from the same location. The yelping continued at from two to four minute intervals until nearly 8 a.m. with no response from the gobbler. The "yelper" finally stopped, and after the woods had been quiet for about a quarter of an hour, I decided to move.

The stream I had scouted was intersected by a smaller stream about a quarter of a mile from my stand. At the apex of this intersection was a fairly extensive swamp. I figured this was where the turkey probably had gone, but I didn't have much hope of a response. Since it was still pretty early, I decided to ease over in the direction of the swampy lowland and try a few more yelps on my box. When I had gone a little way, I came to a rise that was about 100 yards directly in front of the swamp. On my left was a thick stand of pines that dropped steeply off to the small stream. Stretching down to the swamp and to my right was an open hardwood forest. I felt that if I succeeded in getting the turkey interested he would probably come out of the swamp and strut toward me through the open woods. With that in mind, I selected a large stump and sat in front of it to break my outline.

After about 30 minutes, the birds resumed chirping, and the chipmunk that I had alerted started scurrying around, so I eased out both calls and sent forth four or five yelps with the box call. Almost immediately, from deep in the swamp, came the wild sound I was straining to hear — gobble-gobble-gobble. This was only the second turkey I had ever tried to call; therefore, I couldn't rely on experience to tell me what to do next. I didn't know whether to call immediately or wait awhile. While I was debating with myself, he gobbled again, closer this time. He seemed to be right at the end of the swamp and in the edge of the hardwoods where I should have been able to see him.

I strained my eyes, but I couldn't see him. I decided it was now or never; I sent forth three short yelps. There was no response; I didn't know whether I had scared him with a sour note, he had seen me, or he was just being coy. I waited a few minutes and tried three low muffled yelps, hoping to convince him that I was moving away from him. I laid the calls aside as carefully as I could and got ready. I knew he had heard me, and I figured that was about all I could do; the next move was up to him. I waited for what seemed to be an eternity, straining my eyes and ears to catch the first hint of turkey. Nothing . . . Then I heard it; almost directly behind me, something was walking in the leaves.

The sound resembled a man's footsteps; they even stopped every few seconds, as I would have done if I had been looking for something. I couldn't imagine the turkey coming from behind me when he had been almost directly in front of me less that 15 minutes earlier. I decided another hunter must have heard my yelping, and that he was sneaking up on me, thinking I was a turkey.

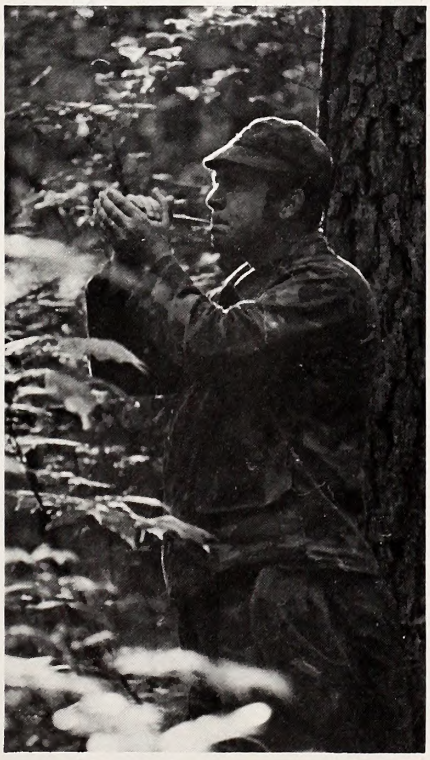


PHOTO BY TED DOSSETT

It's not so much what type of call you use, as what you say and how you say it. Keep hidden and don't "talk" too much.

I figured that if I sat very still, he might walk on past me, and I might have a slight chance at the turkey I supposed to be in front of me. But, instead of walking on by the stump and me, he walked directly to it and stopped about 10 feet behind me. I decided to ease my head around, to see his legs, and maybe whistle or something because I certainly didn't want to get shot. I hadn't moved my head more than a couple of inches when I heard the thunder of wings. The force of the turkey's takeoff caused leaves to swirl at least five feet in the air. By the time I got to my knees, whirled around, and had the safety off, he was in the pines. All I saw was the blur of wings and the three-foot spread of his magnificent fan. I only had a chance for a snap shot which I didn't take.

I have hunted grouse since I was a small boy, and I know how fast they can disappear. I sincerely believe that even though that turkey was at least ten times the size of the largest grouse, he vanished just as fast as the best of grouse.

The few minutes I dueled the king had made me tighter than a drum; every muscle was tense. I definitely would not advise anyone with a heart condition to enter the woods after the greatest of game birds; I don't think a weak heart could stand the excitement.

I could have kicked myself for not considering that the turkey might sneak up through the pines to check out the "hen" rather than strutting in the open hardwoods. I did, however, learn a couple of valuable lessons. Don't assume you know what kind of animal it is by the sound it makes in the leaves, and always expect the unexpected from a wild turkey.

No, I didn't bag my gobbler in 1976, but I learned a lot that will help me achieve that goal in 1977. As a result of thorough scouting and patient practice, I was able to call up two more gobblers, and to see a total of seven turkeys. I hunted mostly on Saturdays when competition from other hunters was the greatest. I used to feel that if I could call a gobbler in, he would be mine. Now, I realize that even after one gets a gobbler into his call, only a skillful hunter will need to make a trip to the nearest checking station.

Mountain Raccoon Project

by Tom Henson
Wildlife Biologist

● 'Coon hunting in the mountains of North Carolina has long been a tradition. It is popular with mountain born males of all ages, from the boy just big enough to follow the dogs, to the oldster who is not physically able to climb the ridges to the "tree" but goes along to listen to the bugling and bawling of the dogs on a hot trail. Among 'coon hunters there is a feeling of both fellowship and competition. When 'coon hunters get together, many friendly arguments erupt over who has the best dog, whose dog is best at straightening out a cold trail, whose dog is leading the chase, whose dog is "treed," and whether or not a dog is "lying" when a 'coon cannot be located in the tree he is barking up. However, when it comes to an issue concerning their sport, 'coon hunters band together. Many clubs have been formed to further the mutual interests of their members in the sport of 'coon hunting.

It was in response to one of these clubs that the Game Division of the North Carolina Wildlife Resources Commission undertook, in the fall of 1976, a comprehensive five-year study of the raccoon in the mountains.

The purpose of the study is to determine the factors which influence the number of raccoons present and to determine management practices and techniques which may be effective in maintaining maximum numbers.

The first step was to set up four different study areas representative of typical mountain habitat. These four areas include the Coweeta Hydrologic Laboratory lands in Macon County, the Sherwood and Harmon Den Bear Sanctuaries in Haywood County, and a private area in Macon County which has been closed to hunting for a number of years. Different types of management have been planned for each area to determine which type may be the most practical and effective. Success obtained by live trapping raccoons will be used to determine and compare populations on the study areas.

The Coweeta Area has been set up as a control area. No special management will be carried out and it will remain open to hunting under statewide regulations as in the past. This area will be used as a basis for comparison for the other three areas.

The Harmon Den Bear Sanctuary has been closed to raccoon hunting and will be closed for the remainder of the study. By comparing trapping success on Harmon Den with that on Coweeta, biologists can determine the effect hunting has on a population.

The Sherwood Bear Sanctuary has also been closed to raccoon hunting. A number of raccoons will be released on this area to determine what effects stocking might have on populations in the long run. Trapping will also help determine if released raccoons stay in the area of release, a question often asked by clubs involved in transplanting animals.

To assess raccoon population levels at the beginning of the study, trapping was carried out from mid-August to mid-October on each of the study areas. It began again on February 1 and will continue through March 31. Trapping success during these periods will show any significant differences in the number of raccoons on these areas. This is important since further comparisons during the study must be based on initial populations. Trapping over the next four years will then reflect any increases due to the different management practices.

Fifty traps are used on each of the four study areas. Live traps made from one inch mesh woven wire are used and are baited with sardines. If any of these traps are found by hunters or hikers, they should be left undisturbed. They are marked and can be identified.

Captured raccoons are marked with ear tags of a characteristic color and special number. If any of

The raccoon project utilizes live traps like this one shown here in a snowy setting. The wire mesh trap is baited with sardines.

These traps are placed in areas where raccoons are known to frequent. The biologist in the photo below is checking a trap set near a mountain stream.

these tagged animals are found, the nearest representative of the Wildlife Resources Commission should be contacted and given the number and color of the tags if possible.

The mid-August through mid-October trapping period yielded a total of 14 raccoons captured in a total of 6,388 trap nights (one trap set one night). The trapping and tagging program continued during March with six additional raccoons captured in the early part of the month. Three of these were "re-captured" animals with one having been tagged last fall. Other species of animals captured included 63 skunks, 46 opossums, 9 red squirrels, 2 groundhogs, 2 birds, 1 rat, and 1 rabbit. Four Wildlife Management Crews were involved in the trapping. These are located at Andrews, Burnsville, Franklin, and Waynesville.

Raccoon hunters have been very cooperative in a phase of the project which involves collecting teeth, stomach samples, and female reproductive tracts from raccoons taken during the hunting season. This data yields valuable information on the biology of the raccoon.

Examination of the female reproductive tract can reveal whether a female has given birth during the year and, if so, the number in the litter. This is determined by the presence of scars in the uterus where the unborn young were attached. From this information comes the determination of average litter sizes, age at first breeding, and the percentage of adult females bearing young. These factors are major considerations in the management of any species.

Stomach content analysis gives information on what foods a raccoon prefers. As far as practical, habitat can then be managed to produce maximum amounts of these foods.

From the lower incisor tooth collected from each hunter harvested raccoon, and tranquilized live-trapped raccoons, comes the age of the animal. Aging involves cutting a very thin section from the root of the tooth and processing it with the proper biological stains. Examination under a microscope reveals a number of rings in the section which corresponds to the age of the animal. Age structure of the population can then be developed. This involves separating the raccoons into various age classes. As a general rule, a large number of animals in the younger age classes indicates an expanding population.

Another phase of the study is the determination of raccoon movements by the use of radio telemetry. This is being carried out on the Sherwood area. It involves the application of radio transmitters to raccoons and the use of receivers to keep the animal located. This will give information on how much territory a raccoon covers in his day-to-day activities. The method will also be applied to transplanted raccoons in order to determine what happens to them and where they go after release.

One adult female was tracked for seven days during early October. During this period, movement was very limited. The extreme limits of movement were only about one mile apart. Movement was not limited to the night hours as is commonly thought but was also common during the day.

Other aspects of the study to be initiated in the near future include surveys of food supplies and den availability. Weather conditions at different times of the year will be compared to population estimates throughout the study to assess its effects on annual populations.

The study will furnish valuable information which biologists can use to assure sound management and maximum numbers of raccoons in the mountains. To be a success, it must have the continued support and cooperation of mountain raccoon hunters.

Live trapped raccoons are tranquilized (below), so that a lower incisor tooth can be extracted for age determination. An ear tag is applied to identify re-captured animals. Some raccoons are equipped with radio-transmitters and tracked (above right).

PHOTOS BY LARRY HARTIS

Turkey Tension

by Jack Smith
Charlotte

PHOTO BY LEN RUE, JR.

THE break of day made the tall pines which surrounded me give off a sparkle as the first pink light filtered through them. It was opening day of our spring turkey season and I found myself working feverishly trying to find the "Lost John" turkey caller which I had so carefully packed in my ruck sack the night before. After what seemed to be forever, I finally found it. Like a master violinist or a diamond cutter preparing to cut the "Hope Diamond," so very carefully I started working the call hoping to make "old Tom" think some sweet little hen was lonsesome and wanted company.

The "love music" was coming from the call but I wasn't confident on how it sounded because my face and fingers were numb from a stiff wind that was blowing off a nearby river. The temperature had dropped unexpectedly the night before to an unseasonable 30 degrees making it feel like I should be climbing into my favorite tree stand to wait on a "Bear Hall Buck" to come slipping down a trail checking his scrapes rather than sitting behind a ground blind, turkey hunting. Again I called, then listened, called and listened, no answer; but, then why should there be?

The way my luck had run over the past several days, my mind began to wonder. Just three days earlier, I had cut my finger to the bone sharpening broadheads and on the same day, my youngest son had found my "Lost John" call and tried to make a toy car out of it. Needleess to say, it was hopelessly ruined. This in itself caused panic in my house until I was able to locate another one. And last but not least, on the evening before the hunt I decided to use a neighbor's foam target to check out my broadheads in final preparation. I stacked my first six arrows on top of each other and had the shot group just the way I liked it, however, much to my dismay, when I went to pull the arrows out I found that all six broadheads and shafts were ruined. In checking, I found that yellow jackets had built a nest in the huge piece of foam during the winter and my neighbor had stuck a large rock in the hole to suffocate them. Naturally, the rock and the hole were located dead center in the target and just where I had put my turkey silhouette to shoot at.

My mind kept telling me, don't be a pessimist; there were a lot of good things happening also. A good friend and expert bowhunter, Jerry Rushing, had run across this hot spot while doing some preseason scouting and had unselfishly called and invited me to hunt with him today, plus, the equipment I was using was compliments of Jennings Compounds. The 60 pound Trail Boss and the Ace in the Hole quiver had been sent to me to field test.

Then, like a clap of thunder that nearly scared me to death, my brief daydreaming came to an end as the unmistakable answer of a Tom turkey jolted me back to reality. His gobble was without a doubt a thrill that I will never forget. I slowly handed my call to Jerry and when I glanced at his face, he had an ear-to-ear smile that reminded me of the way the comic strip character "Snoopy" smiles before taking off in his "Sop With Camel" in pursuit of the Red Baron. As serious and excited as I was, I thought I was going to choke to death holding down a laugh. Jerry put his thumb in the call to muffle the sound a bit and called again; an immediate answer came. Again, Jerry called but this time, no answer. Once again he called; no answer. Through all the excitement, had we made an unfamiliar noise or called too much and blown the whole hunt?? My heart sank as my eyes strained looking for the slightest movement of the big bird, but nothing.

Like a small child who had missed the "free ride" ring on a merry-go-round, I dejectedly started to let out a sigh of disappointment but like a ghost, Old Tom seemed to appear out of thin air, not from the pines in front of me as we expected, but through a large rocky bluff that came up from the river bottom below us. His head looked like a bobbing fishing cork as he went in and out of the rocks. Be cool, don't blow it. Be cool, don't blow it, I kept telling myself. You've come a long way baby and now is not the time to fall apart. After all, you've taken over 25 big game animals with a bow and this was just another hunt.

Who was I kidding? This was one

There is special pride in taking a wild turkey with a bow and arrow. Skill, persistence and maybe a bit of luck are required by the bowman.

of the most thrilling moments of my hunting career. Daring not to move a muscle or even blink my eyes which were covered by a head net, I waited. If he kept on his steady course, there was one more big rock he would have to go behind before he got in shooting range and that's when I would have to make my move. Sure enough, he headed right behind the big rock and I slowly brought the Jennings to full draw. But instead of coming on in as expected, he stopped halfway as if to groom himself, making sure he looked his best for the sweet little hen that had invited him.

My arms and fingers began to ache from the tension of having to hold my bow at full draw and rock steady and my eyes began to water from the cold wind blowing on my face. There was little doubt that I wouldn't be able to hold on much longer.

Finally, he must have thought, "Well, you handsome devil, don't keep the little lady waiting" and made his move in front of the huge rock. Without hesitation, I stared a hole in his vital area and released the arrow. In a split second, I saw my white feathers disappear just where I had aimed. The big tom started to run and tried to takeoff but like an ill-fated airplane, made a nose dive and came to a silent halt.

I let out a scream of excitement and ran straigtht through the blind trying to get to the bowhunters dream which lay before me. After much handshaking and backslapping, I picked up my big bird and headed out of the woods with a feeling that could only be known by other bowhunters. ⬍

BACK OF THE BOOK

- Letters
- Comments
- This & That

TRAIL CONFERENCE

The spring 1977 meeting of the Appalachian Trail Conference, to be held at Shepherd College, Shepherdstown, West Virginia, is expected to be the largest meeting of hikers and other persons concerned with foot-trails yet held in the United States. Preparations are being made to handle more than 1,500 persons at the conference.

Some 1,200 of these are expected to comprise either individual members of the ATC or members of its 60 affiliated clubs, while about 300 are expected to represent a score of other American and Canadian organizations actively engaged in trail-building and trail maintenance. Some participants are expected from as far away as the West Coast.

The theme of the conference will be "Building on a vision—from the Appalachian Trail to a national network." More than 50 years ago the late Benton MacKaye published his famous article calling for a great national trail linking the eastern states—the vision that gave birth to the Appalachian Trail. Within the past few years comparable national trails have been opened along the Pacific Crest and the Rockies, and the National Scenic Trails Act has given new impetus to the idea of establishing a network of such trails throughout the country. The ATC plans at its spring meeting to compare the experiences and insights of various trail-building groups and try to chart new directions for common action.

The conference is to be held at Shepherd College, Shepherdstown, W. Va., beginning Friday May 27 and concluding Monday May 30, with daily hikes scheduled thereafter through Friday June 3 for those staying on. During the conference workshops are scheduled on approximately 20 topics of concern to trail users and trail-builders. Independent hikers and other interested persons are welcome to participate.

It will be possible to register at the site on Friday, May 27, opening day of the conference, but latecomers may be unable to obtain dormitory space or meals on campus. Accordingly, advance registration is urged for those planning to attend. Registration forms can be obtained from the Appalachian Trail Conference, Box 236, Harpers Ferry, W. Va. 25425.

Host club for the conference will be the Potomac Appalachian Trail Club of Washington, D. C. Oldest of the ATC member clubs formed specifically to help build and maintain the Appalachian Trail, the PATC will be observing its 50th anniversary simultaneous with its hosting of next year's conference.

BOOK REVIEW

"A Season of Birds" is a recently released (early last fall) book authored by Dion Henderson on uncommon observations of common backyard birds. There are 36 essays, each with a well-done illustration by Chuck Ripper whose rail painting appeared on the September, 1976, cover of "Wildlife." The price of the 88-page, hard-cover book is $5.95, plus 60 cents postage. It's available from Wisconsin Trails/ Tamarack Press, 517 North Seoe Rd., P. O. Box 5650, Madison, Wi. 53705.

KNOW YOUR ENFORCEMENT OFFICER

Kenneth R. Craft

Wildlife Enforcement Officer Kenneth R. Craft was born in Rocky Mount, N. C. on August 30, 1951. He is the son of Mr. and Mrs. L. T. Craft of Route #6, Rocky Mount, N. C. Ken is a graduate of Northern Nash High School and obtained an Associate of Applied Science Degree in Fish and Wildlife Management from Wayne Community College in Goldsboro, N. C. Prior to his employment with the N. C. Wildlife Resources Commission, he was employed by the Ground Water Section of the N. C. Office of Water and Air Resources.

Ken completed the pre-service school for Wildlife Enforcement Officers in June, 1974, and the nine-week Basic School in August, 1975. He was employed as a Wildlife Enforcement Officer on October 1, 1974, and was assigned to Red Springs, N. C., where he still resides. Ken is a member of the Robeson County Wildlife Club, the Southeastern Association of Game and Fish Commissioners, and the North Carolina Association of Wildlife Enforcement Officers.

Ken is married to the former Becky Holmes and they have two sons, Brandon, age 4½, and Samuel, age 1.

ENFORCEMENT RECORD FOR JANUARY, 1977

HUNTING AND FISHING	
Persons Checked	12,786
Total Prosecutions	967
Total Convictions	836
Total Fines Collected	$19,027.00
Total Costs Collected	$17,770.00
BOATING	
Boats Checked	348
Total Prosecutions	70
Total Convictions	52
Total Fines Collected	$ 45.00
Total Costs Collected	$ 1,242.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

• **TROUT from page 5**

apathetic to our offerings or now being discriminate by turning down the bait with gusto. I had one eye on the pool as I opened the trunk and reached for my fly rod. I proceeded to find a No. 16 hook. I rigged up my rod, still watching Ed, desperately afraid that I would not make it in time. To be extra careful, I quickly extended my leader with a very fine three-foot tippet, the diameter of which was close to a silken strand spun by a spider. I tied on the hook and hit the trail back to the pool.

Fortunately for me, Ed had not caught a fish yet. I proceeded downstream, entering the tail of the pool. I was so excited by this time that I did not notice that I had forgotten to put my waders back on. The cold water felt refreshing as it seeped into my walking boots. I continued up the stream and positioned myself behind a bush within sight of the seven rainbows. Reaching into my vest pocket, I brought out a handful of corn. I chummed the pool and in the same motion, offered them a kernel of corn which deviously was hiding a No. 16 hook, completely tucked inside out of sight. My kernel matched the rest of the batch perfectly, so much so that I could not tell that it was taken until my leader began to move off. I raised my arm in excitement, setting the hook solidly.

The fight began as I waded back downstream. I could feel the power at the other end. The feeling was magnificent. A short time later I had a large 16-inch rainbow in my net and a grin on my face. By this time, Ed had been joined by Hugh and they both watched with envy. But this did not stop me, after all this was my last trip to this place. They would have it for two more years.

I slipped back up to the same spot behind the bush. I repeated the process. Another fine trout repeated the response. Backing downstream I had hooked another 16-inch rainbow. At that point it would have been easy to succumb to greed and return to my spot to catch the rest. Instead, I offered to share my secret with the others. Hugh took me up on the offer so I spent five minutes adapting his rig. Now he was ready.

When I returned to the pool, Ed had quietly slipped over to my spot behind the bush. He was chunking a wad of corn on his No. 8 hook still. I calmly entered the head of the pool, hugging the bank. I repeated my procedure once more and number three was hooked. Leading him upstream was a bit more of a struggle, but I netted him. By this time Hugh had hooked into a fourth trout. I came to his aid and netted a big one for him.

I returned to the head of the pool, repeating my matching the batch technique. This time number five took the hook with great force, breaking my line. I was stunned. What could I do? I had given my last small hook to Hugh. I reached into my vest pocket for a small nymph. The Catskill Coiler, tied on a No. 12 hook, would have to do the trick. Several casts later it did as another beauty sucked it in. After I netted him, I sat down for some relief.

Never before had I discovered such good fortune in this stream. Never before had I witnessed such discriminate trout over corn! It was hard to believe. And yet, there before my eyes lay four of the nicest trout, freshly cleaned. In all, I had my limit for sure. But I had much more. I had caught good size trout on my fly rod, using purist principles of fine leaders, small hooks, and even an artificial nymph. But I had used the farmer's bait, niblets corn, too!

Could I have caught those trout if I had restricted myself to purist tactics alone? Perhaps so, perhaps not. What meant more to me that day was that there would be fresh rainbow trout on the table for supper that night. On any other occasion just the opportunity to be out doors and on a trout stream without catching any fish would have been a great enough reward. But, it would be the last supper for a

long time that would see rainbow trout on the menu. I would be moving three days later to an area where rainbow trout are unheard of. Surely this last time out was a combined gift from the Jolly Green Giant and the great W's, Walton and Wulff. Being a preacher of sorts, I would have to say that God had something to do with it too! ⬍

• ROADS from page 9

wild things.

At the present time, federal and state officials are reviewing the system of access roads in our game lands. It is likely that closures will be made. We hope to see a 50 percent reduction. The U. S. Forest Service has already adopted an interim plan for control of "off-road" vehicles which closes nearly half a million acres, including areas where the turkey is the featured species.

It is certain that whatever the final plan, it will be controversial. There will be those who feel that they have the right to ride whatever public road they wish whenever they please and who will be indignant at the prospect of having this right usurped. However, the overriding objective of the appropriate wildlife agencies should be to adopt policies which will be of maximal benefit to wildlife. It may be necessary for some of us to make personal sacrifices to accomplish this.

The U. S. Forest Service and the North Carolina Wildlife Resources Commission have the power and authority to affect closure of access roads, but it must be remembered that these agencies try to reflect the desires of the people in the decisions they make. A loud minority may wield more influence than a less vocal majority. If you feel as we do that the establishment of more "walk-in" areas in our game lands is a desirable goal to work for, write to the Supervisor of National Forests in North Carolina (Box 2750, Asheville, N. C. 28802) and to the Wildlife Resources Commission (Albemarle Bldg., Raleigh, N. C. 27611) to express your support.

To keep informed on wild turkey problems and progress throughout the nation as well as in North Carolina, join the National Wild Turkey Federation (Box 467, Edgefield, S. C. 29824) and its North Carolina Chapter. This will enable you to work with an organization dedicated to insuring the future of the wild turkey. ⬍

• BOATS from page 19

operate your boat who is inexperienced, particularly if he (or she) is under the influence of alcohol.

CASES involving collisions between motorboats and other vessels where both vessels are under way are generally caused by one of three errors: (1) negligence in steering or handling, (2) failure to have or utilize the required equipment, such as lights or signals, (3) failure to maintain a proper lookout, or a combination of these. These errors also apply to cases involving drifting motorboats that collide with other vessels, or motorboats that collide with waterfront structures or obstructions in the water. In most collision cases, negligence on the part of the motorboat owner or operator has been the key to the verdict. In the case of storms where a boat's mooring has failed to hold and it has inflicted damage to the property of others, some cases have held that the owner didn't take necessary precautions prior to the storm, or used improper methods during the storm to avoid damage. But in other cases, the owners have been exonerated because the court felt the storm was an act of God and the owners couldn't have anticipated or reasonably dealt with it.

Explosions and fires resulting from leaking gasoline or stove fuel have frequently occurred on motorboats. In cases brought by injured persons the decisions have been based on whether the owner or operator was negligent in failing to maintain his boat in a safe condition, or failing to use the right methods of inspection. The cases have gone both ways, but in a number of cases, damages have been denied where the court felt the defect was hidden, that it could not be found by a reasonable inspection by the owner.

In such a short space, only a few of the increasing number of cases in every state can be shown, but certainly boating is furnishing more than its quota of accidents and lawsuits, due in large part to inexperience. If you are involved in an accident and you sue or are sued for damages, it's wise to retain counsel experienced in Admiralty Law, even though your action is initiated in a State Court. By all means, carry as much liability insurance as you can afford. You never know what wind and wave have in store for you. ⬍

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Photo by Michael Godfrey

Building Material

Nest-building materials are where they find them for many wildlife species. This robin is gathering Spanish moss to add to its mud and twig nest cemented in the crotch of a nearby tree.

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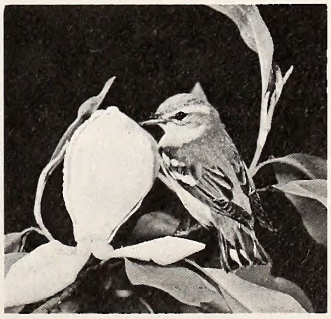


The cerulean warbler is a rather uncommon bird to our North Carolina scene. It is generally listed as being "transient in migration" although there are reports of nesting in our state. The blue of the male's head and back varies from rather bright to slate-blue. This warbler is a small bird, a bit smaller than a Carolina wren. Photo by Karl Maslowski.

Our "Goodliest Land" - Where?

by Charles E. Roe
Coordinator, N. C. Natural Heritage Program

EVEN today the pronouncement of early settlers that North Carolina is the "goodliest land" holds true. We need not be told of the natural beauty and diversity possessed by our state. We can see that fact, no matter the direction, from mountain vistas and white-waters to beach dunes and surf, from spruce-fir forests to cypress swamps, spartina salt marshes to health balds, montane bogs to coastal pocosins, trout streams to black water embayments, piedmont bottomland woods to marine coral encrusted reefs. We know our North Carolina is rich in its magnificence.

But we also know that each year a bit more of this natural heritage disappears to the blade and burn, the fill and blasting that come with urbanization and the quest for prosperity. Our wildlife, particularly the native non-game species, are pushed back into ever more isolated enclaves. State scientists and resources managers list several hundred native plant and animal species whose survival is endangered or threatened.

What progress has been made for identifying and protecting unique natural areas and natural habitats in our state?

The North Carolina Natural Heritage Program is responsible for inventorying the special ecological elements that make for the importance of North Carolina's natural lands and, using this information, planning for the protection of the most significant natural areas. We do not work in isolation, since many others pursue similar concerns.

The Department of Natural & Economic Resources last year requested The Nature Conservancy to initiate the Natural Heritage Program for the State of North Carolina, as it has done for South Carolina, Tennessee, and West Virginia.

PHOTO BY ROBERT E. DEYLE

We are fortunate in North Carolina to have numerous unspoiled areas, some a few acres, and several rather extensive. Whether these represent homes for fritillary butterflies (above) or black bears, they need to be located and preserved.

Indicative of the tradition of private support for conservation in this state, the Mary Reynolds Babcock and Z. Smith Reynolds Foundations, with matching money from the federal Bureau of Outdoor Recreation, donated the funds for operation of the Heritage Program in its first year. The December, 1976, issue of this magazine described the work of The Nature Conservancy, a national nonprofit organization devoted to preserving unique natural areas through private action.

In its initial year the Natural Heritage Program has rapidly assembled comprehensive information on North Carolina's natural diversity. The information collected and recorded on maps and computer retrieval system aids resource managers, conservationists, and scientists. If the Natural Heritage Program is incorporated as part of a state agency, the program will provide a full assortment of information services needed for our public works planners, natural resource managers, local officials, and other decision-makers to direct North Carolina's growth while protecting precious natural values.

The goal of the Natural Heritage Program is to help preserve our natural diversity by contributing to improved environmental impact analysis, identification of special natural features, stimulation of public and private acquisition of natural preserves, and encouragement of land conservation by private property owners through programs of education, dedication, conservation easements, and tax incentives.

The research of the Heritage Program, discussions with scientists, park naturalists, refuge managers, and citizen conservationists, our reviews of museum and herbarium collections and scientific research of others, and field reconnaisance work has vastly increased our appreciation for North Carolina's natural lands. We could write of the majesties of many natural areas, but let that come later. Our concentrated study of the state's resources has also impressed us with the grim realities of their destruction and the fragmented condition of con-

Public interest and support of the Natural Heritage program is fundamental to its success. Significant areas of natural interest once lost are gone forever.

DNER PHOTO

Many of the natural areas in our state contain some unique geological feature such as Pilot Mountain shown here, or perhaps a special plant community which needs protection. Public support of this program is needed now.

servation efforts.

The Natural Heritage Program attempts to bridge gaps and coalesce information and conservation efforts. Yet, others also work to understand and to protect our natural diversity.

The scientific community within our universities is the most able and respected among the Southern states and furnishes critically needed research on natural areas and endangered species. The Highlands (NC) Biological Station, a consortium of southeastern universities supported by foundations and public grants, is striving to advance ecological research.

The State Museum of Natural History, a part of the N.C. Department of Agriculture, has established a high degree of excellence in zoological research and environmental education. It has sponsored preparation by expert scientific committees of a non-official list of the state's endangered and threatened native animals and plants. The dream of the State Museum is a desirable one: creation of an inter-agency, multi-disciplinary North Carolina Natural History Survey.

The Wildlife Resources Commission seeks to improve and expand a management and biological research program for protection of endangered, non-game wildlife species. Financial support from hunters, fishermen and the public in its "Carolina Conservationist" program and funds from license revenues have not been sufficient to fully administer this ambitious project to date.

The Division of State Parks & Recreation has made acclaimed advances in building the state park system in recent years, including the donation of several natural preserves and doubled state park acreage. The Natural Heritage Program builds upon the work of the Division's natural areas studies coordinator, naturalists, and natural and scenic rivers program.

The N.C. Land Policy Council proposes that all counties devise public plans for their future growth. Proposed land classification plans would identify certain areas of environmental concern, agricultural and other naturally productive lands where future urban development would be discouraged. The Land Policy Council is also devising a land resources information service to aid local governments and citizens.

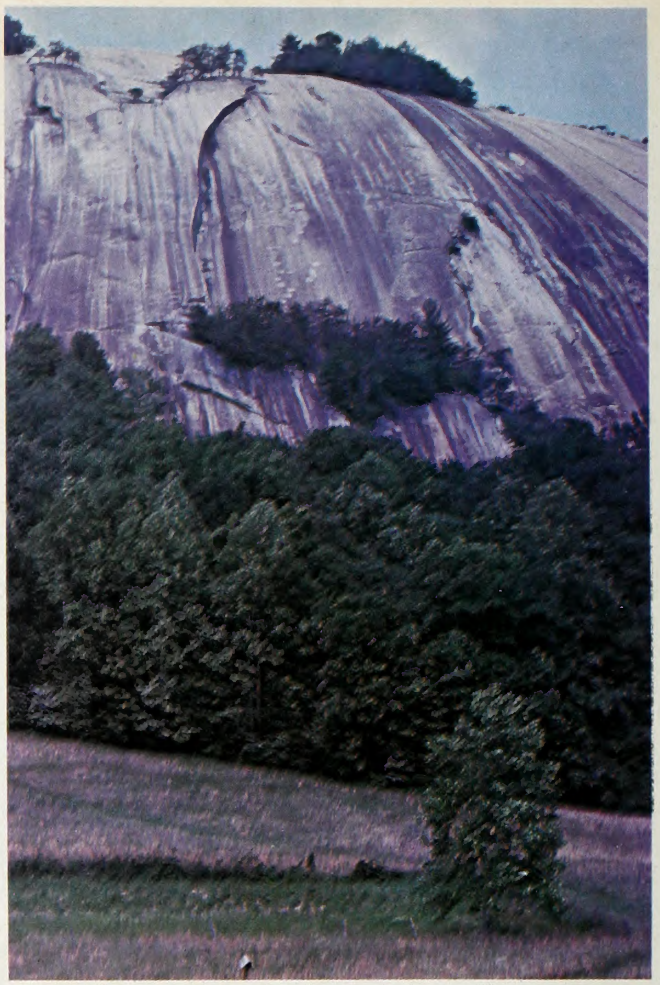
The Department of Natural & Economic Resources is the locus of the state's acquisition and preservation efforts for critical natural areas. The Department's resource management divisions and commissions (parks and recreation, forestry, fisheries and marine affairs, environmental management, environmental assessment, coastal resources commission, national parks and forestry commission) in sum offer the principal public vehicles for safeguarding our state's natural heritage.

Other governmental and private agencies and universities have set aside wilderness areas, wildlife refuges, preserves, forests, and seashores. A potentially powerful public base of support for land conservation exists within such organizations as the Wildlife Federation, Garden Clubs, Conservation Council and Conservation Foundation, Wild Flower Preservation Society, Audubon and Sierra Club chapters, Trout Unlimited, as well as numerous regional and local coalitions, such as the People to Preserve Jockey's Ridge, Northwest Environmental Preservation Association, Eno River Association, Upper French Broad Defense Association, and Committee for the New River.

Preeminent among these private efforts is the N.C. Botanical Garden, centered in Chapel Hill. Beyond its propagation, research, and rescue operations for native plants, the Botanical Garden is devoted to public education and protection of natural habitats. The Botanical Garden possesses several natural preserves.

Citizen or private involvement is essential for protection of our natural lands. Citizens efforts may be more critical, more important than government endeavors. Ultimately the people of North Carolina are the guardians of their state's rich natural resources. Governmental action follows the sentiments of the public.

Even now the conservation activities of public and private sectors are fragmented. The challenges demand concerted, allied action. This conceivably can happen on the government's side through joint attention by concerned agencies. Interagency cooperation, though difficult to achieve, offers greater pos-



PHOTOS BY ROBERT E. DEYLE

Important natural areas range from the bogs of the Coastal Plain with rather rare plants such as these yellow pitcher plants and Virginia chain ferns to highland and mountain . . .

. . . spots with massive rock formations like Stone Mountain, the central attraction of Stone Mountain State Park. The time remaining to place such areas under protection is short.

sibility of success. Active involvement, support and initiative on the part of private organizations and concerned citizens, however, are the key ingredients for achieving our goals of retaining our natural heritage.

How can the isolated and divergent public interests for land conservation be coalesced? Just as the Natural Heritage Program is intended as a bridging and building mechanism for public agencies, so too does The Nature Conservancy hope to galvanize a coalition of citizen interests. Establishment of the North Carolina Nature Conservancy, a branch of the national organization, provided potential financial resources, professional abilities, and membership base both to support and provide alternatives to governmental programs. Working with other conservation organizations and universities, the North Carolina Nature Conservancy offers North Carolinans an opportunity to take an active role in seeing the natural beauty and diversity of our state preserved.

North Carolina's natural heritage can be best protected through the cooperation of government agencies, private organizations, and concerned citizens, using a wide range of protection techniques. North Carolina possesses a rich, though endangered, natural heritage. The state has the potential to conserve its heritage if its people choose to do so.

North Carolinians who are interested in helping preserve their state's irreplaceable natural heritage may join the North Carolina Nature Conservancy, a branch of the national organization. Membership categories are: $500—Life; $100—Guarantor; $50—Supporting; $25—Contributing; $15—Family; $10—Subscribing; $5.00—Student; $1,000—Corporate. Dues include membership in the national organization, and a subscription to the quarterly magazine. Send your check made payable to The Nature Conservancy with your name and address to: P. O. Box 805, Chapel Hill, N.C. 27514. For more information about the N. C. Nature Conservancy, write Field Representative Tom Massengale at the above address. Remember, all contributions are tax-deductible.

Canoeing The Lumber

by Ed Forbes
Parks Supervisor
Scotland County Parks & Recreation

AS the canoe glides through the coffee-colored meandering Lumber River with its overhanging moss-laden cypress, I lean back into the canoe, relax and enjoy this experience in the wilderness. I think back to last summer and the hard work and enjoyment of the young people of Scotland County who made this experience possible, the Youth Conservation Corps workers of 1976.

It all began in the spring of last year with the planning meetings for the upcoming summer YCC project. The Youth Conservation Corps is a program jointly administered by the United States Departments of the Interior and Agriculture and is administered in North Carolina through the Department of Natural and Economic Resources. The purpose of the Youth Conservation Corps program is threefold: to accomplish needed conservation work on public lands, to provide gainful employment for 15- to 18-year-old youths from all social, economic, ethnic and racial backgrounds and to develop an understanding and appreciation in participating youth, of the Nation's natural environment and heritage.

A canoe trail was a project that Scotland County Parks and Recreation Commission had been planning for three years and now had the opportunity to implement. The majority of the work of clearing this canoe trail was accomplished by YCC workers under the direction of crew leader, Don Coleman. Additional aid was supplied by a snagging crew from the North Carolina Wildlife Resources Commission under the direction of Mr. William Belton. The Youth Conservation Corps workers spent many hours working from a 14-foot jon boat sawing deadfalls and clearing the river, stretch by stretch.

After the hard work of clearing the river came the added touch of "signing" the trail for use by the public. With knowledge gained from many hours of experience on the Lumber, the YCC installed directional signs on the river so that visitors would follow the correct route. In some cases the traveler follows the ox-bow and in others he takes a short-cut through the ox-bow.

The crowning touch of the project was the publication of a brochure giving essential information such as entrance and exit points on the trail, necessary supplies and equipment, travel times from point to point along the trail and points of interest such as Riverton Park with its swimming, picnicking, and bathroom facilities.

The Lumber River Canoe Trail was officially opened on September 6, 1976 with a dedication ceremony held at Riverton Park along with the running of the 1st Annual Lumber River Canoe and Raft Race from the Wildlife Acess Area on US Highway 401 to Riverton Park, a distance of five miles. Mr. Howard Pullen of the North Carolina Department of Natural and Economic Resources Department commended the YCC workers for their outstanding work on the trail. Commenting on the trail itself Mr. Pullen stated, "This trail has some of the most beautiful natural scenery anyone could ever hope to see."

The Lumber River Canoe Trail stretching 50 miles along the northeastern border of Scotland County is a truly beautiful gift that the Youth Conservation Corps workers have left for future generations. In order to appreciate the beautiful scenery and wildlife of the Lumber River, one should see it first hand in a canoe.

For a brochure on the Canoe Trail or information on the Annual Lumber River Canoe and Raft Race, write or call Scotland County Parks & Recreation Commission, Post Office Box 1910, Laurinburg, North Carolina 28352 (919) 276-0412.

HEART WORMS:

Your Dog's Enemy

by Dr. John Freeman

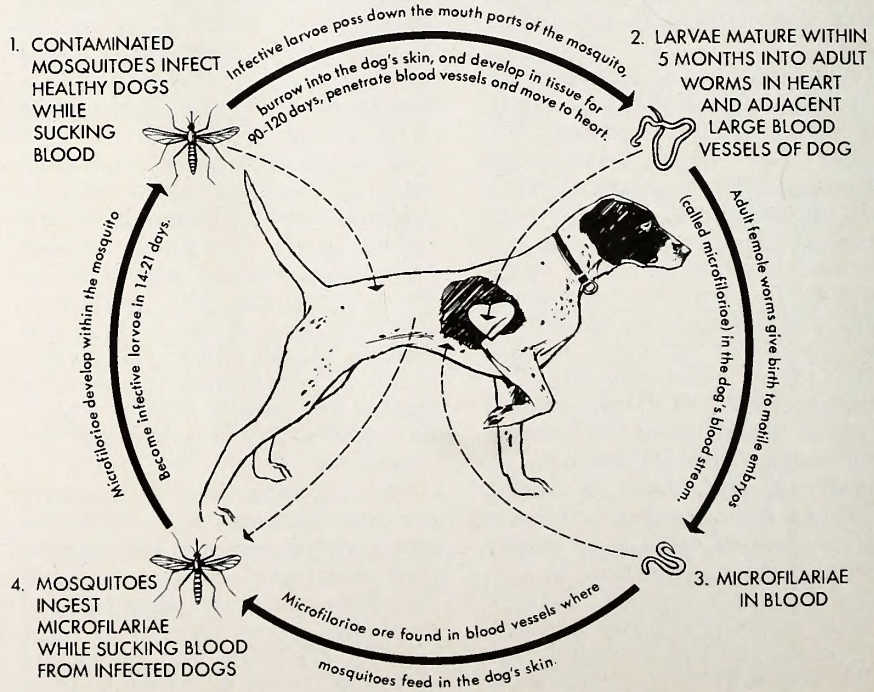
HEARTWORMS, a parasitic infestation primarily of dogs, as the name implies, localize in the heart and pulmonary artery. Heartworms in the blood vascular system of any dog reduces his ability to live a normal life as a working, sporting, or companion animal. Dogs infested with heartworms have been found throughout North Carolina from the coast to the mountains and no dog can escape the risk of this enemy. However, the problem is greatest in the Coastal Plains area of our state and by nature of the spread of this infestation, the risk is greatest in dogs that normally live outside the sheltered environment of the owner's home.

Heartworms are transmitted to dogs and occasionally other animals, such as cats, foxes, coyotes, muskrats, and even man by the bite of a mosquito. In North Carolina, the **Culex pipiens quinquefasciatus,** commonly called the "Southern House Mosquito," is the primary vector. Other species of mosquitoes have been known to transmit heartworm disease but are of little consequence in North Carolina. The Southern House Mosquito breeds in a variety of places where there is non-flowing polluted or stagnant water. Primary breeding places include abandoned automobile tires, various containers around a house that collect and hold water, sewage drainage from overflowing septic tank, and various other types of drainage ditches that contain standing water.

It has long been known that the greatest number of dogs with heartworm disease are found in the Coastal Plains area of North Carolina. The closer to the coast, the greater the amount of heartworm disease that can be found in the dog population. There is no apparent difference in the infestation rate due to breed, sex, or type of hair coat, but the life style of the dog can affect his chance of acquiring this disease. Dogs that live inside the house have less exposure to mosquitoes than dogs that live entirely out-of-doors.

Life Cycle of the Dog Heartworm

The adult dog heartworm, **Dirofilaria immitis,** is found in the right ventricle of the heart and pulmonary artery. The adult worms are grayish white in color, very slender, and may grow to a length of 18 inches and live for as long as five years. When the female heartworm reaches sexual maturity, microfilariae are produced and released in the circulating blood. The microfilariae that are circulating in the blood vascular system are not harmful to the dog even though they may be present for as long as two years. When a **Culex** mosquito takes a blood meal from an infested dog, it may ingest microfilariae along with the blood. If microfilariae are ingested by a mosquito, they must undergo a maturation process and migrate back to the



mosquito's mouthparts. When the mosquito takes another blood meal, the microfilariae are injected into the dog and the life cycle of the dog heartworm begins anew.

Signs

The signs of heartworm disease are varied and non-specific. Onset of signs are generally slow and insidious and because of this many dogs are in a poor state of health when heartworm disease is recognized. Generally, the first sign to be noticed by an owner is a chronic cough which is aggravated by exercise, or tiring on exercise, or both. As the disease progresses, the dog may experience difficulty breathing, become more sluggish in his activities, and become exausted from slight exercise. In the advance stages, fluid may accumulate in the chest and abdominal cavities which gives the dog a full or distended appearance.

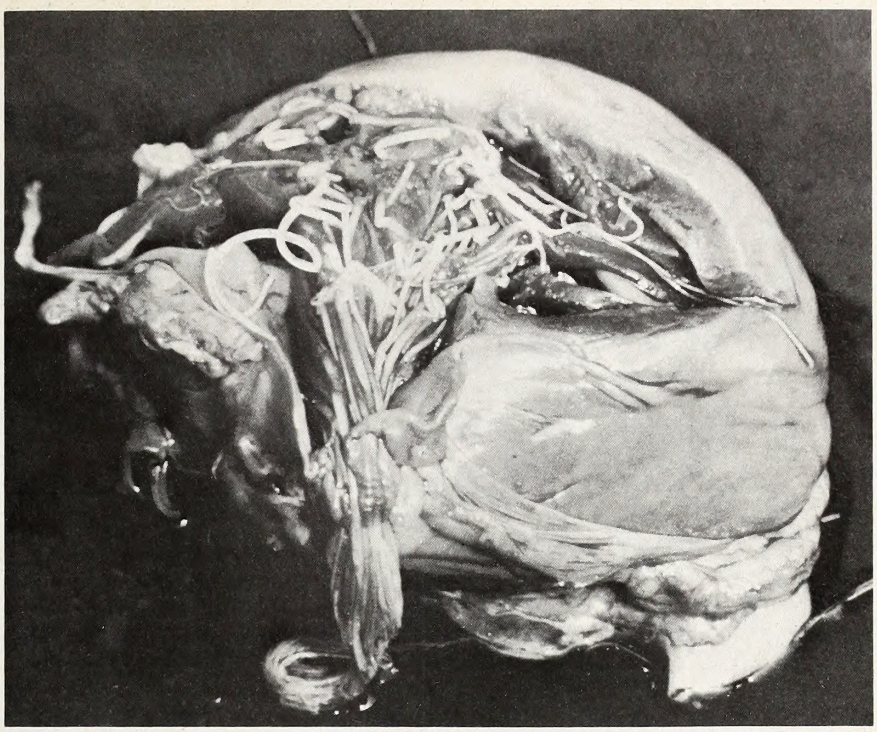
Diagnosis and Treatment

Heartworm disease in dogs is relatively easy to diagnose by a veterinarian. The diagnosis is based on finding the microfilariae of **Dirofilaria immitis** in the blood. Other microfilariae that may be found in the blood, **Dipetalonema sp.** being the most common found in dogs, must be differentiated from those produced by the heartworm. Electrocardiograms and x-rays are of value in diagnosing heartworm disease.

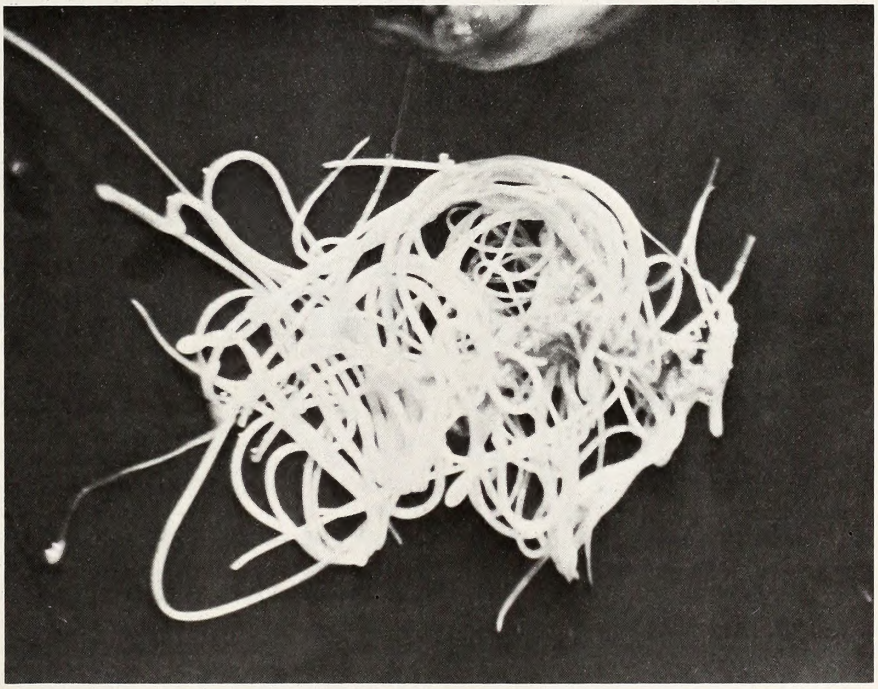
Treatment of heartworm disease in a dog is certainly not without risks. Surgical removal of worms has been successful in a small number of dogs but this approach is quite expensive and not very practical. The most common method of treating heartworm disease is the intravenous injections of an arsenical drug. Dogs that have impaired liver and kidney functions are poor risks for treatment of this disease. Post-treatment care for four to six weeks is most important, particularly keeping the dog as quiet as possible. The heartworms that are killed by the arsenical drugs eventually break-up and are dispersed primarily to the lungs and other organs of the body. This is a severe shock to the animal's body and several weeks are required for recovery. With recovery from such treatment, there may still be some permanent damage to the lungs. This factor is more important in working and sporting dogs than in non-working dogs.

The old adage "an ounce of prevention is worth a pound of cure" was never more true than when talking about heartworm disease in dogs. With the drugs available today, it is relatively easy and inexpensive to prevent this devastating disease in dogs. Preventive drugs may be given daily in the dog's food or periodic intravenous injections. Dogs that are currently infested with heartworms must be treated and cleared of the disease before preventive measures can be taken. Consult your local veterinarian for advice and assistance in either the treatment or prevention of heartworm disease.

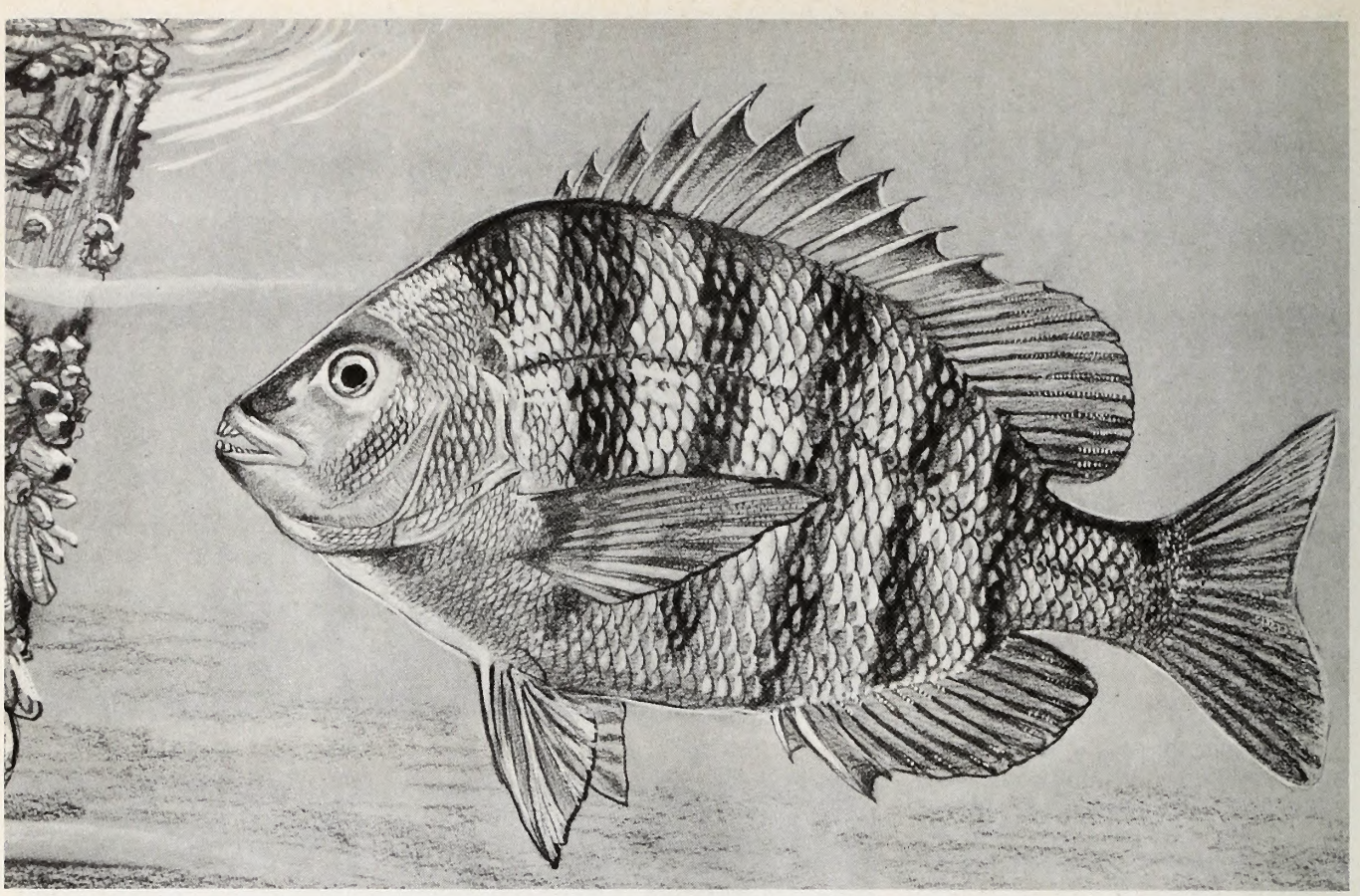
It is often said the dog is man's best friend. Return this friendship by protecting your dog against one of his worst enemies — heartworm disease.



PHOTOS BY JEROME B. KEARBY, D.V.M.



Months pass between the time the mosquito injects the infective heart larvae into the dog's bloodstream and the time the long, thin, white worms appear in the animal's heart (top). When this heavily infested heart was dissected, a pile of fully grown heartworms was removed.



SHEEPSHEAD: Little-known Gamester

by John Crew

SIXTEEN pounds, eight ounces is a lot of fish; it's really a lot of fish if it happens to be a sheepshead. That's the current state record which has been standing since 1969 when Mr. Pete Hart pulled him out of the Cape Fear River near Southport. Average size in North Carolina usually runs from two and one-half to four pounds and an eight pounder is big.

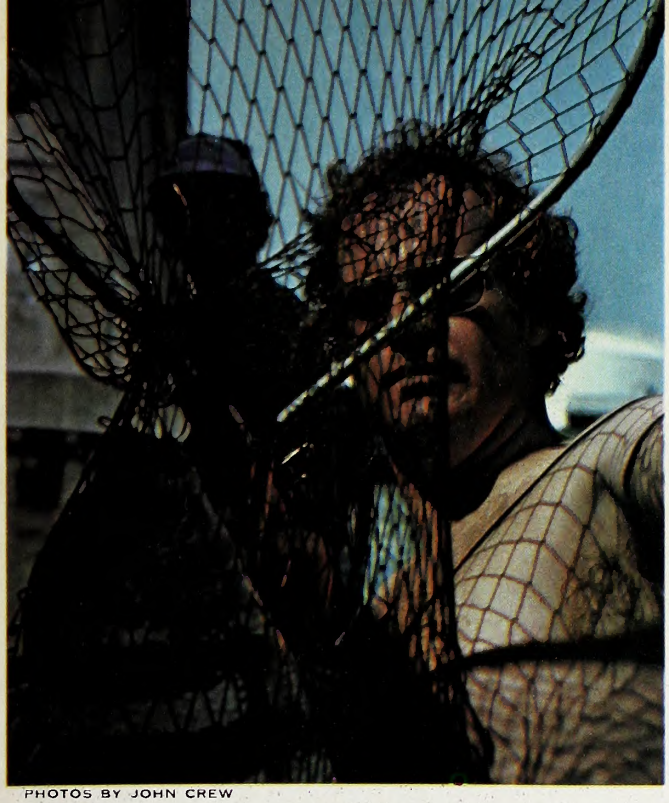
Since North Carolina is blessed with such a variety of salt water species, sheepshead fishing is not in the limelight. In fact, it's relatively unknown and many sheepshead taken are hooked by fishermen trying for some other fish. How unfortunate! The small group of sheepshead aficionadoes have been having the time of their lives with this gamester. To many of those who have tried it, sheepshead fishing becomes a passion. For good reason. He's tough to hook, fights like crazy, is hard to boat and superb on the table. Since he frequents inshore waters and has a preference for pier pilings, he's readily available with a minimum of effort and cost.

Most sheepshead fishing is done from small boats from March through November with August, September and October the best months. He's numerous around dock pilings, piers, bridges and other underwater obstructions from Roanoke Island to Calabash. Practically any inlet, bay or sound that has these obstructions with plenty of oysters and barnacles will have sheepshead near. Time-tested baits include sand fiddlers, small crabs, clams, sand fleas, small shrimp and sea worms, but the experts agree sand fiddlers are tops since they stay on the hook a moment or two longer than soft baits.

While there is not much disagreement about baits, violent arguments result over equipment. Basically, there are three schools: the light-action school who use lightweight rods including fly rods; the medium-action group preferring conventional fresh water spinning and bait casting rigs; and the heavy-duty group who swear by standard salt water gear. All three have their points but before you decide for yourself, you must understand the fish.

What Big Teeth You Have!

First, his name is very appropriate. Take a good look at his mouth. He has teeth that, well, look like they belong in an animal designed for grazing rather than in a fish. Inside, his mouth is constructed of boney plates. Since his natural foods are crabs, oysters and barnacles he must have tough dental equipment; and this makes it tough to hook a sheepshead. Secondly, he has a habit of wrapping around barnacle-encrusted pilings once he's hooked. This plays havoc with leaders and lines. When he bites it's not a strike as with other fish. In fact, a slight nudge or nibble describes his "bite" better than anything else. Some fish are caught unex-



PHOTOS BY JOHN CREW

A net is often good insurance when you hoist a nice sheepshead aboard, and for a real big one, it may be essential. This day's catch of sheepshead (and a couple of tautog) ran from a couple of pounds to over five.

pectedly when you reel in to check the bait. All of these characteristics make this zebra-striped fish a tough customer.

At any rate, the theory behind the light weighters is they can feel the bite better. Long, limber rods with light leaders do allow for better bait control. The trade off is you'll lose a lot of fish with light equipment and they're hard to hook with the light rod. When hooked a sheepshead will head for the pilings, and barnacles have the same effect on light leaders that razor blades would. Most light weighters are the experts who have been after sheepshead a long time.

The heavy equipment school is based on the winch 'em in theory. Steel leaders and heavy sinkers tire the fish more and stand up to the oyster shells better. Sinking the hook is easier and sheepshead can be yanked away from pilings with heavy gear. There's little doubt fish can be landed with such equipment but the secret with this heavy gear is hooking them. Stiff rods and heavy terminal tackle do not lend themselves to feeling a tiny bite very well, though.

The mid-weighters are the compromisers. Conventional bass rods and reels don't allow for the feel light ones do, nor do they have the backbone of the heavy weights. They do, however, allow for reasonable bait control and fighting ability and with proper terminal gear your chances, overall, are probably better. A bass rod with 12-to 20-lb. test monfilament, a couple of feet of light stainless steel leader, a heavy number five hook and a one-ounce egg sinker are hard to beat. Take along plenty of extra terminal tackle because you'll lose a lot. If you hook half the fish that you feel bite and land half you hook, you're far ahead of the game.

When To Fish?

Regardless of the gear you choose, the time of day you fish is very important. Since there are swift tidal currents around pilings, it's difficult to keep the bait down without excessive weights during slack tide. Most sheepsheaders agree that an hour before, to an hour after, high tide are the most productive times. Since there's less current then, the bite's easier to feel.

During low tide, some fishermen take a hammer or shovel to the piling they want to fish and bash up the barnacles and oysters. This produces a chum that supposedly keeps attracting the fish as the tide rises. Chumming has its enthusiasts, but sheepsheaders are about split on whether it helps. I believe it does and you're there already, so why not? Even if the edge is only psychological you'll need all you can get when the action starts.

Chum or no, heavy tackle or light, all sheepshead fishermen follow the same basic techniques. Carry a couple of lengths of used rope for tying around the pilings to save your painter. Tie up, bait up and drop it overboard as close as you can to the piling. Let the bait free spool until it hits bottom, quickly engage the spool and raise your rod tip about a foot to get the bait off the bottom.

It's critical to engage the spool and begin raising the rod immediately because often sheepshead will steal the bait before you can react! If you haven't gotten a bite immediately, begin "jigging" the bait up and down for about a foot and set the hook if you feel the slightest unnatural touch. It's uncanny the way sheepshead can crush a sand fiddler and inhale the remains before you feel it. It's a common saying among sheepshead fishermen that you actually need to strike immediately before you feel the bite! That may sound strange indeed, but if you have time to realize you've had a bite it's too late. Try it and you'll get the picture.

If you jig for five minutes or so without a bite, check your hook;

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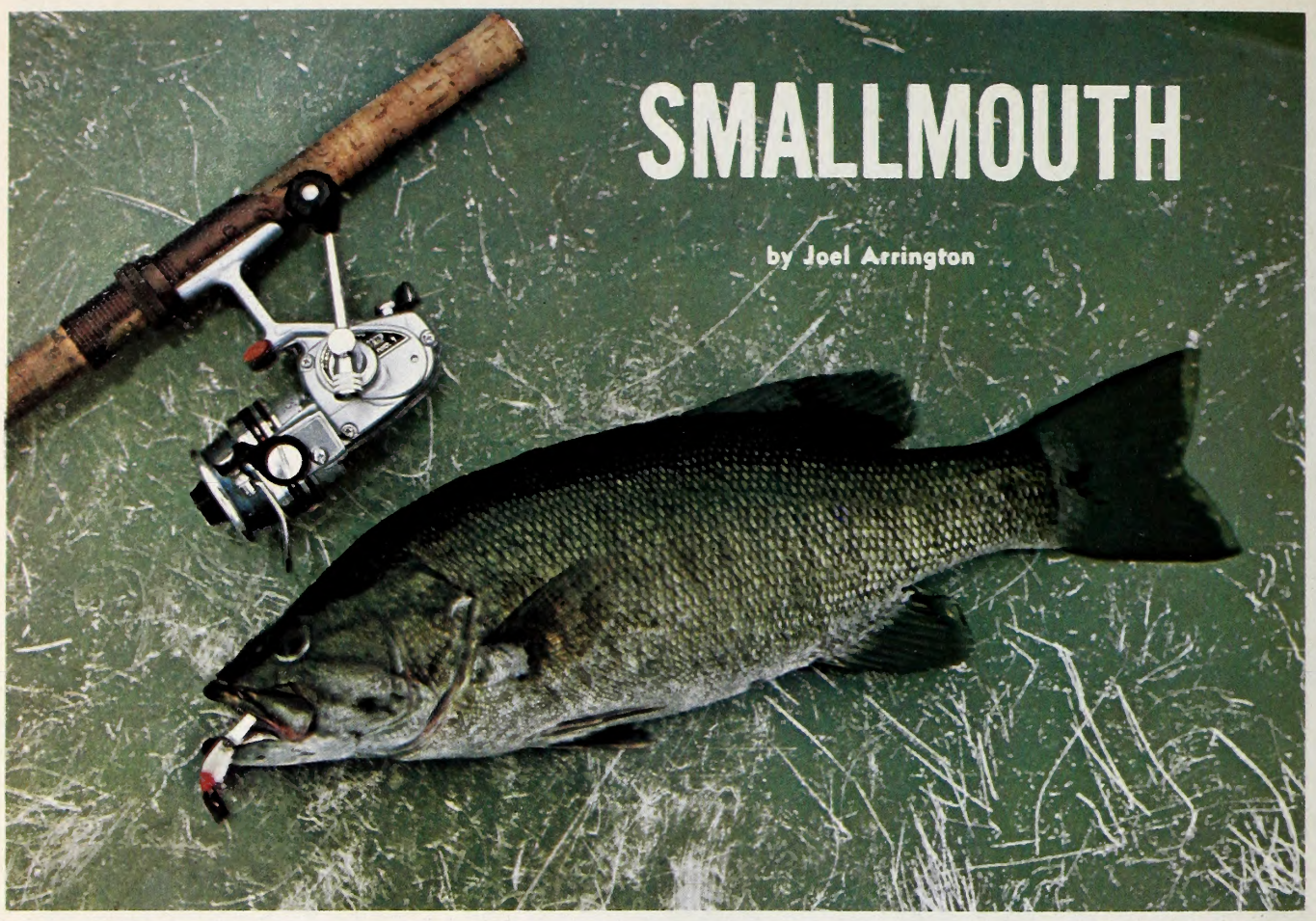


SMALLMOUTH

by Joel Arrington

PHOTO BY JOEL ARRINGTON

OVER the central and northeastern states and in Canada, smallmouth bass are highly regarded game fish, largely because the species is a much better fighter, pound for pound, than largemouth bass. But only a few fishermen know the quality of smallmouth fishing in North Carolina.

Original habitat was from Vermont to Manitoba and south to South Carolina, Mississippi and Arkansas. In the southeastern states, smallmouths are now confined primarily to mountain lakes and streams. They were once known to occur in the Neuse River near Raleigh and in the Little River at Goldsboro, but they vanished before 1900, undoubtedly because of habitat deterioration.

Smallmouths prefer cooler, cleaner and swifter water than largemouth bass, as a rule, although both species occur in a few mountain lakes. The smallmouth requires a gravel bottom and moving water for successful spawning, while largemouths can spawn on anything but soft mud.

In North Carolina, smallmouths are a fish of the mountains and foothills. The best fishing for them is in high mountain lakes, but there is some minor fishing in the lower parts of streams which support trout at higher elevation.

There is no natural lake in western North Carolina. All are impoundments, most of which were constructed by power companies and the Tennessee Valley Authority. Alcoa built Cheoah in 1919, Santeetlah in 1927 and Chatuge in 1928. TVA built Hiwassee in 1940 and Fontana in 1944. The Nantahala Power Company constructed Glenville lake in 1941 and Nantahala in 1942. Without these impoundments, lake fishing in western North Carolina would be quite different from what it is today.

Tarheel mountain lakes are not all alike, but they have at least two things in common: They are deep and cold. A few are almost strictly trout lakes—Cheoah, Bear Creek, Julian Price and Trout Lake. These largest impoundments—Santeetlah, Fontana, Hiwassee, Chatuge—offer principally smallmouth and largemouth bass, walleyes, white bass, crappies and bluegills.

It's a wonder anyone ever catches a decent fish from Fontana Lake. Biologists say it is quite nutrient-poor, has a relatively small population of forage fish, and is too cold to grow fish rapidly. Yet, every year it gives up dozens of largemouth bass over eight pounds as well as countless thousands of smallmouths, walleyes, white bass, crappies, catfish and panfish.

The reason is that there is much water backed up behind the highest dam in eastern America. With a maximum depth of 440 feet, there are about 250 miles of shoreline, and the lake holds about 1.5 million acre-feet of water. (An acre-foot is an acre of water one foot deep.) Fontana produces fish by sheer water volume. Naturally the bigger game fish are widely scattered and hungry. But there is another important factor—relatively little fishing pressure.

Experienced anglers know that

the smallmouth is highly temperature sensitive. It feeds most actively when water temperature is between 65 and 70 degrees. Natural baits, particularly salamanders, crayfish and hellgrammites, are more effective than lures when the water is below 60 degrees. At about 70 degrees, smallmouths readily take artificials. Surface temperatures of Tarheel lakes reach the ideal range for smallmouths in April and May and again in October. Although the average smallmouth bass from a North Carolina lake weighs only about 1.2 pounds, they are numerous. Three-pound fish are common.

Lake fishing pays off best when anglers fish at the depth where the temperature is suitable for the species pursued. For example, if you are fishing for smallmouths in summer, when surface temperatures may be in the high 70's or low 80's, you should fish deep, but not at great depth, where the water is likey to be considerably below 60 degrees. Electric oxygen monitors now on the market are perfect for locating fish in mountain lakes.

Most anglers prefer casting along a shore to deep trolling. Fortunately, there are long periods in spring and fall when the surface temperature of mountain lakes is suitable for most game fish species, although spring is better by far. In summer and winter, deep trolling and jigging pay off while surface fishing is likely to be fruitless.

Santeetlah Reservoir's smallmouth fishing is every bit as good as Fontana's. Hiwassee ranks with them, but Nantahala leaves much to be desired. The lake is poor in nutrients and apparently does not support a large fish population. Chatuge has some smallmouths, but its reputation is not as good as Fontana's nor Santeetlah's because it is at a lower altitude and therefore is warmer.

Several streams in the state have fair to good smallmouth fishing. Johns River and lower Wilson Creek are not bad. The lower Linville River from Lake James up into Linville Gorge is good. Elk Creek in Wilkes County is a good wading stream, as is the Rocky Broad River below Lake Lure.

Among the best smallmouth streams in the state are the New River, the Tuckaseigee below Dillsboro, the Little Tennessee below Franklin and the Pigeon River below Waterville Lake. A combination of wading and floating is usually most effective.

PHOTO BY JIM DEAN

The color pattern of smallmouth bass (lower fish) ranges from distinct vertical bars and dark blotches to the solid olive of the fish on the opposite page. Largemouth bass (top fish) usually have a dark band from the eye down the side to the base of the tail. The upper jaw of the largemouth extends back beyond the eye when the mouth is closed.

In 1972, the Wildlife Commission stocked 10,000 smallmouth fry in the French Broad River in an attempt to re-establish the species after most pollution was abated. The smallmouth population has improved, but significant fishing pressure has not developed.

Tarheel lake fishermen, for the most part, favor six-foot, medium-action spinning rods with open-face reels spooled with six-pound to 10-pound test monofilament. Favorite lures are leadhead jigs weighing from 1/16 ounce to 1/4 ounce, balsa and plastic minnow imitations, and French spinners from size #1 to #3. Lures are tied directly to the line, without a leader.

By far the favorite bait is the salamander, locally called spring lizard. Live ones may be bought from marinas on most mountain reservoirs and from bait and tackle shops in towns near the major lakes. Lizards are usually hooked through the lips and fished alive, without lead, around rocky shorelines.

Particularly good spots for smallmouth bass are the mouths of creeks which empty into lakes. Streams bring food and oxygenated water and usually harbor feeding smallmouths.

Stream fishing requires much the same tackle as the lakes, but offers good fishing with fly rods and popping bugs in certain conditions. May is a good month for poppers, provided the water is not too high and turbid. White poppers with black hackle tails on 1/0 hooks are favored by experienced fishermen.

High winds which may accompany spring and summer squalls may end fishing temporarily, but they also may create an ideal condition for smallmouth fishing. Wind-driven waves lap against the shore, creating a band of dingy water in which smallmouth bass will hide to bushwhack baitfish. Anglers who get out after a shower and fish these shorelinese may find cooperative smallmouths numerous.

Rental skiffs and outboard motors are available at marinas on most Tarheel mountain lakes. Guides may be hired for about $40 per day for two anglers. The guide furnishes the boat, but not the bait, if you use any. All lakes have free boat ramps as well as private ramps where fees are charged.

A fishing license is required for all inland waters, except for anglers in their county of residence fishing with natural bait. Three-day and annual licenses are available for nonresidents.

Lakeside campsites are open from spring through fall. All lakes are near towns and communities which cater to tourists, so motel accommodations are plentiful. Reservations in advance are advised in summer.

Planning the Future of a WILDLIFE PARADISE

by Cleve Cowles*

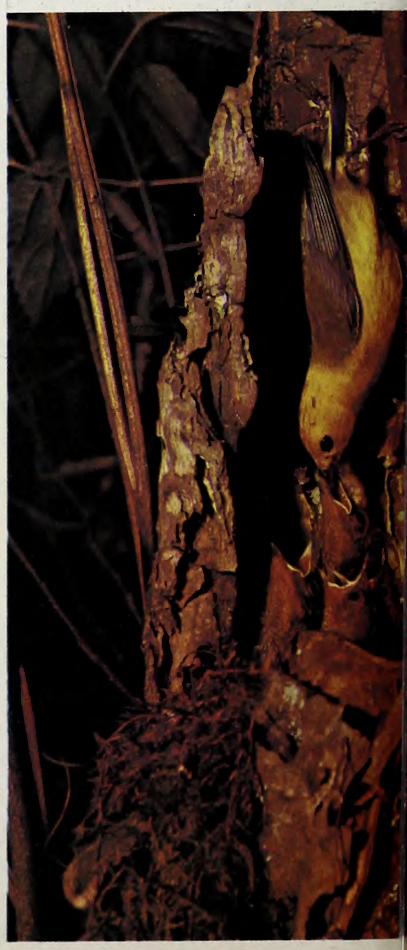
IF you know the right folks in Beulaville, they'll tell you they have it all "rhat-cheer" and that's not far from the truth. It hasn't really been a secret; it's just that nobody ever asks. When you are traveling through there on NC routes 24, 111, or 241, make sure you don't blink your eyes or you'll miss it—Limestone Creek, that is! A few bridge crossings are the only sign of the wildlife paradise that lies adjacent to this slow-moving stream which loops around the north of town on its 15-mile journey to the Northeast Cape Fear River.

*The author was a biologist with the N. C. Wildlife Resources Commission and is presently a Graduate Research Assistant in Wildlife Management at Virginia Polytechnic Institute and State University.

One of the Least Disturbed Bottomland Tracts in the Whole Coastal Plain

Back in the early 1800's, it probably wasn't as slow moving and you'd have known for sure you were crossing the creek as your wagon bounced and jounced over the corduroy log crossings. Back in those days, Duplin County was mighty busy with more than a dozen sawmills being fed by seemingly unlimited timber. Those sawmills had a lot to do with making Limestone swamp what it is today. The combined effects of trees topped and left in the stream, of erosion from cut-over areas and nearby farms, and of the replacement of the old crossings with earthern roadbeds served to slow the water's flow and allow the deposition of sediments. The silt appears to have filled much of the channel and this has extended the bordering swamps upstream, so that today this beautiful cypress-gum swamp covers thousands of acres. Most of the sawmills are gone and the local economy turned primarily to cash crops such as soybeans and tobacco. Nestled down behind all those tobacco fields is a teeming ecosystem that

PHOTO BY MICHAEL GODFREY



Wildlife of this rich bottomland area depends on the relatively undisturbed habitat along the creek. Furbearers such as this raccoon (above) forage in the stream and in the surrounding timber area. The prothonotary warbler (first right) finds suitable nesting in tree-hollow nests. The large pillated woodpecker (middle right) chisels a nest in a large tree amid Spanish moss. The water areas attract many wading birds (far right) as well as wood ducks and other waterfowl.

comprises one of the least disturbed bottomland hardwood tracts in the entire North Carolina Coastal Plain.

Floral and Faunal Diversity

Broad, wet, swampy areas are found all along the creek and are occupied by what is called the cypress-gum and bottomland hardwood forest type. This forest is bordered by narrow, transition bands of Coastal Plain upland hardwoods before the land use changes to agriculture. Another important forest type in the creek's watershed is loblolly pine - hardwood found in a variety of successional stages on upland areas previously disturbed and then abandoned by man.

The moderate climate and wet conditions have allowed an extremely diverse plant community to flourish. In the bottomlands, overstory species such as cypress, blackgum, sweetgum, red maple, water oak, willow oak, laurel oak, and swamp chestnut oak are festooned with clumps of Spanish moss. Scattered along the creek are ancient, hollow cypress, some as much as six feet in diameter. These dominant species shade an understory consisting of American hornbeam, holly, tag alder, sweetbay, and swamp dogwood. Close to the creek the shrubs and herbs are almost nonexistent and walking along with a good pair of boots or waders is relatively easy. A little further away from the creek and at slightly higher elevation cane, greenbrier, honeysuckle, and leucothoe can be found in profusion. All these species contribute energy and protein to the animal components of the system. The diversity of plants insures a diversity of wildlife species associated with them.

And what a showcase of wildlife there is! If you really got down to business, through the course of the seasons of a year it might be possible to find as many as 39 different amphibian, 47 reptile, 216 bird, and 42 mammal species in the watershed, many of which rely on the cypress-gum and bottomland hardwood habitat. At least 17 of the critters that are suspected of being in the Limestone watershed are included on a preliminary list of endangered species in North Carolina. Most of these are classed as having an "undetermined" population status throughout the state, meaning that the experts are not too sure of just how large their populations are. Included in this classification are the eastern tiger salamander, the Carolina gopher frog, red-shouldered hawk, Cooper's hawk, sharp-shinned hawk, red-headed woodpecker, and Swainson's warbler.

Many unusual and interesting species can be observed. Bright yellow prothonotary warblers flit across the stream as you walk along. Barred owls seem complacent as they are heard hooting frequently, even in the middle of the day! Pileated and red-headed woodpeckers can be seen occasionally and find a portion of the timber of satisfactory age and density for providing nesting habitat. Dwarf waterdogs and strange, two-legged sirens stalk prey beneath the placid surface of pools in the creek. There's plenty of water moccasins but hip boots worn during summer explora-

PHOTOS BY EUGENE HESTER

tions can allow you to relax and enjoy the scenery. Leave your gun at home; these snakes are important predators in the swamp's food chain and will go their own way if given a chance. Caution should be exercised since there are a few big ones and all are hard to see.

Evidence of furbearers abounds. Muskrat cuttings of fur-reed can be seen near bridge pools. Further from the roads, otter signs are found where piles of crawfish shells and fish scales represent the scraps of bygone feasts. Local hunters and trappers have reported the harvesting of hundreds of raccoons, numerous muskrats, mink, and otter along Limestone Creek in previous years. Deer hunting in the watershed is a major sport. At least two hunt clubs have territories along the creek since these woods are a valuable sanctuary for deer. Certainly from the standpoint of the hunter, birder, or photographer, this easily accessed wetland (only an hour and a half drive from Raleigh) is a gem indeed.

At Least 39 Fish-filled "Lakes"

Scattered along its whole length, but mostly on the middle and upper reaches of the creek from NC 111 upstream, are at least 39 "lakes." These pools, averaging more than 200 feet long and 40 feet wide, have been formed behind obstructions or constrictions in the stream. Their deep water, as much as 11 to 12 feet in some spots, is the haven for an unbelievable array of fish and other aquatic life. At least 36 different species of fish are known to occur in the stream. There are little ones that ichthyologists delight in finding such as the green sunfish, bluespotted sunfish, lined top minnow, swamp darter, tessellated darter, margined madtom, pirate perch, swampfish, and taillight shiner. Recent discovery of the taillight shiner in Limestone Creek was a surprise and considered an extension of this species' range.

In addition to these interesting little fellows, there's plenty of big ones to entice the sport fisherman. Redfin and chain pickerel (jack) are plentiful and eagerly await a tempting lure. Although not to be expected on every cast, the fisherman should consider three- to four-pound pickerel a possibility. Other game fish of catchable size include warmouth (goggle-eyed perch) and flier. Bowfin (blackfish) known to run five pounds could provide a real tussle as well.

But let's not be too choosy, it is estimated that these pools hold up to 240 pounds of fish per acre and a lot of that is tied up in bullheads. Not only are they easy to catch, the yellow, brown, and flat bullheads which occupy these pools are excellent eating and a good source of protein.

Well, need I say more? When you go for that stroll along Limestone Creek, take a short, light rod and have yourself a great day's fishing. Actually there is no need to walk. Providing you don't mind pulling a canoe over a lot of logs, the creek can be floated from NC 41 north of Beulaville all the way to the river. Debris from recent logging has left a few stretches nearly impassable, however.

If you don't waste any time, you'll probably have a lot of the fun to yourself. Commission biologists have concluded that these waters are underutilized and could withstand greater fishing pressure without a loss in the standing crop or catch rate. Fishing is a year-round possibility since mild temperatures occur even in the winter months of January and February. It can be concluded that Limestone Creek offers the hardy, adventuresome sportsman who doesn't mind hiking past the bridge pools, a remarkable and exciting fishing opportunity.

PL 566 Watershed Project Being Planned

As mentioned above, Limestone Creek has a penchant for spilling its banks at any time. All it needs is a good rain and acres of woodland are under a slow-moving, shallow sheet of water. This, of course, is a major influence supporting the bottomland forest ecosystem. Species adapted for this environment have found the situation much to their liking. There is one species which does not adapt so well to periodic floods—man. Back in 1954, Public Law 566, The Watershed Protection and Flood Prevention Act, was passed which provided federal funds for stream "modification" measures such as flood retarding structures (dikes), channelization, clearing and snagging, land treatment for run-off control, fish and wildlife habitat development.

The landowners in the Limestone Watershed had an application for assistance under PL 566 approved in March 1971. These people can be credited with their spirit and determination to manage the watershed in which they reside. In fact, they are probably among the most enthusiastic watershed planners in the state. In order to develop a solution to flooding problems that would also provide for preservation of natural resource values, the U. S. Soil Conservation Service has initiated an in-depth study of the entire watershed. Wildlife aspects of this study were contracted to the N. C. Wildlife Resources Commission and Commission biologists have spent several months inventorying resident fish and wildlife, their habitats, and even the extent of their utilization. The Soil Conservation Service is much concerned about criticism leveled at earlier PL 566 projects. Their representatives have pledged greater emphasis on preservation and enhancement of fish and wildlife habitat in planning future watershed projects.

The planning process consists of listing objectives relevant to the watershed's management, identification of alternative courses of action which would achieve objectives, analysis of differences in alternative plans to show tradeoffs among objectives, and selection of a recommended plan. The process is intended to be repetitive and to allow changes in project scope or formulation of new alternatives. The public is invited to actively participate in this process. Active participation would help insure that the values of the entire public are incorporated, not solely those of special interests. Assuming an expression of popular support for preservation of the natural resources associated with this fascinating swampland, a project can be developed that will preserve these values while at the same time provide for the improvement of productivity on adjoing farmland.

There are many different things that could be done to accomplish these objectives, such as careful removal of logs and silt from stream channels to expedite flow, improvement of field drains, stabilizing farm soils to prevent erosion, and digging silt traps to catch eroded soils before they reach the stream channel. With an optimal mix of conservation practices, Limestone Creek might well become a popular canoe trail providing recreation and beauty for many people while simultaneously serving to provide the degree of agricultural drainage desired by local landowners. ♦

Fish Print Series Available

The Wildlife Resources Commission is offering this set of six prints of popular Tarheel fish, ready for framing, for $10.00, postpaid. The set includes the largemouth bass, brook trout, black crappie, smallmouth bass, bluegill, and the rainbow trout, A leaflet describing each fish and its habits is included. These prints are available individually for $2.00 each. Please specify which species desired. These prints are from original paintings by Duane Raver, and all but the bluegills have appeared on the covers of "Wildlife In North Carolina." The bluegills are used courtesy of the Virginia Commission of Game and Inland Fisheries. Send your check or money order along with your complete name and address to Fish Prints, Wildlife Commission, 325 N. Salisbury Street, Raleigh, NC 27611.

BLACKBERRY WINTER

by Robert L. (Rip) Collins
Boone

A multitude of wild plants which produce attractive flowers belong to the Rose Family. This group of plants also provide us with the source of our most delectable fruit, including blackberries. Blackberries comprise the entire genus Rubus of this family.

The jeweled, sweet, juicy blackberry is without doubt the most valuable uncultivated fruit in the Southern Appalachians if not in all America.

Long before the luscious blackberries form, many eyes search the waysides and meadows for the five-petaled, white flowers with green centers and multiple stamens. Sometimes their abundance is revealed by petals which fall like snow to the ground. Such a snow is a forecast of location as well as crop potential. This **snow** also marks a locally recognized "season." The appearance of Blackberry blossoms coincides with a week of cool, damp weather which has become known as **Blackberry Winter.** This is the final, tedious cold spell of spring. After this, warm days of June will not be again interrupted by chilly weather.

There are numerous species of blackberries, raspberries and dewberries . . . so many in fact that experts have difficulty trying to separate and define the plants taxonomically. For practical purposes it is easy enough to refer to the berries growing on upright canes as blackberries and those on trailing vines as dewberries.

The fruit of the blackberry is not a true berry at all in the botanical sense, but rather is an aggregation of tiny, one-seeded drupelets which remain firmly attached to the receptacle. In the raspberries these drupelets readily separate intact from the receptacle and the fruit is hollow in the center.

Anyone who has waded into a blackberry "patch" to challenge birds, mammals, mice, snakes and the minute but fierce chigger, may be encouraged to learn that there is at least one smooth-cane variety of blackberry which grows in our state. Known botanically as **Rubas canadensis,** this plant is fairly abundant in some higher locations and is considered to be a typical shrub of the Hemlock Forest. In our mountains it grows best in the neighborhood of the high balds where other plants of the Canadian Zone also grow.

At these higher elevations the bloom is so late that Blackberry Winter may characterize the waning quarter of June. Hikers along the Appalachian Trail frequently have been chagrined to discover cold, wet weather in the Roan-Yellow Mountain range as late as the Summer Solstice, a time which coincides with Blackberry Winter at that altitude. Since flowering at that altitude does not occur until late June, it is not surprising that the berries do not ripen until the last days of summer. Sometimes they may still be clinging to the bushes at the time of first frost. First frost can be surprisingly early at this altitude. There is a record of snow in September in the Roan-Yellow range of our Appalachian Balds.

The long canes of these blackberries, although essentially thornless, sometimes have small spines which develop along the stem. Blackberry vines without prickles are almost too wonderful for comprehension for those of us who have endured the jagged teeth of the bramble patches to pick blackberries. But even more marvelous perhaps is the fact that few chiggers infest vines at elevations beyond 3,000.

Horticulturists commonly refer to the woody stems of blackberries and raspberries as **canes.** These are short-lived, but the roots live on indefinitely. The first year the canes are simple and unbranched. They regularly die back at the tips. The second year the stems develop into side branches which flower and fruit. Then the canes die. During the first year most stems bear five-foliate leaves. The second year the stems develop side branches which bear flowers and fruits, after which they die. This second season the compound, alternate leaves are trifoliate.

Tangled thickets formed by the multiple stems make excellent wildlife cover. For that reason blackberry brambles are favorite grounds for the cottontail, bobwhite quail and many songbirds. The berries are eaten by a host of wild mammals including skunks, opposums, foxes, squirrels, chipmunks and mice. It is the fondness of the small mammals and birds for the berries which account for the interest of snakes in these locations. They simply follow their prey to the feeding grounds.

In spite of the prickles both rabbit and deer frequently nibble on blackberry stems when snows cover other forage. Ewell Gibbons in **Stalking the Wild Asparagus** says that in the spring when the next year's canes are sprouting from the base of the plant that tender shoots can be gathered, peeled and sliced into a toss salad. In the same book he also offers a recipe for a pass-

If you can save enough berries from the "hand to mouth" folks, the fruit makes excellent jelly and jam as well as pies, all of which are in the making here.

able tea which can be made from blackberry leaves.

But it is the berries with which most of us are familiar. They can be gathered and eaten raw, used in pies, made into delectable jams and jellies and sometimes converted into a tolerable wine.

In our mountains there is a favorite country dish known as THICKENED BERRIES. This is prepared by using either fresh, canned or (more recently) frozen, berries.

While the black jewels get hot in a saucepan, the mountain cook prepares a quarter of a cup of flour and a cup of sugar by thoroughly blending the two ingredients. This mixture is stirred into a quart of hot berries and allowed to simmer together just long enough to reach the consistency of a pie-filling. When served over hot, buttered biscuits one caution must be observed: The cook must be sure to have a sufficient number of biscuits to match the amount of thickened berries. Blackberry eaters are notorious for being unable to complete a meal when biscuits and fruit are not served in equal proportions!

The delicious fruit is equally good in jelly and jam, but no matter how served and eaten — fresh, canned, frozen, thickened, jellied or in pies —most people agree that blackberries picked personally are enhanced by the labor of love.

Many Carolinians are acquainted with the blackberry picking ritual in the sections of the state where briars and chiggers challenge the picker. Since the fruit ripens in those areas during hot days of summer, most pickers plan to be in the patch early in the morning dressed in long-sleeved shirts and pants which will withstand briars. Heavy shoes are necessary. These are often greased along with wrists and ankles to repel the detested chiggers. One favorite method of greasing is to use a salty pork skin.

Salt may be the best repellent against these pesky red bugs which burrow into the skin and create an itching, swollen spot that can drive the most obdurate to distraction. Some old timers preferred saturating the shirt margin at the wrists and ankles with kerosene, perhaps because it was available from the oil lamps in use at that time. A mixture of kerosene and turpentine was sometimes used on the chiggers once they attached themselves to the body. If that attachment were in a tender spot the treatment might have been as rough on the skin as was the chigger.

Our favorite way of picking blackberries when I was a lad was a 50-50 arrangement. We would spend 50 minutes picking berries and then rush to the old swimming hole on the creek where we would spend 50 minutes in the refreshing coolness of the water. Theoretically the water helped keep off chiggers, but only in theory alone. Chiggers seldom wash off in fresh water. Usually it takes salt in the water to deter the burrowing red bugs and now that we have progressed to the days of indoor baths, a hot water and salt soak in the tub may be a more modern chigger treatment which follows a sortie into the blackberry patch.

One other item of wearing apparel was standard for the blackberry picker of a few years ago. It was the high-crowned, broad-brimmed, straw hat. This was protection for the rapidly rising sun and protected the head and neck from the heat which was bound to come before the bucket was filled with the little black jewels. In a rare time when the best berries were discovered just about the time the buckets were filled, the big hat inverted became an additional container for the unexpected bounty.

In order to free both hands to pick, we often used the old tin coffee cups which we strapped to the body by passing our belt through the metal handle. A quart measuring cup was even handier for this purpose since it did not require such frequent trips to relay the berries to the buckets.

These days it is practical to cut a portion of the top from a plastic gallon milk jug and hitch the handle to the belt freeing both hands to pick and fill the container.

Although there are many more people now than in previous years, there seem to be fewer persons who will take the time to gather the black treasure which grows bountifully throughout the state. Everyone recognizes the blackberry when the ripe fruit is discovered in midsummer, but the time to locate your future picking ground is when the large white blossoms make their appearance during **Blackberry Winter.**

YOURS TO DISCOVER:

The North Carolina State Park System

by Marcia Constantino

DAZZLING wildflower displays and mild sunny days bring winter-weary North Carolinians outdoors each spring. State Parks, visited by few people during the cold winter months, become destinations for nature enthusiasts, picnickers, campers, and anglers in springtime.

Visitors taking nature hikes along self-guiding trails are rewarded by discoveries of purple rhododendron abloom in mountain parks, pink and yellow lady slipper in piedmont parks, and the unusual insect-eating pitcher plants of the coastal area. Over 3,000 species of flowering plants found in North Carolina can be seen in the state parks.

Shaded picnic areas with tables, grills, and shelters are available to visitors in most of the parks. Family tent and trailer campground facilities range from regular campsites with drinking water, hot showers, and flush-type toilets, to remote wilderness campsites with primitive facilities for those who prefer roughing it. Lake and river fishing in springtime is best for largemouth bass, crappie, channel catfish, and several varieties of sunfish.

Springtime in state parks also anticipates the June 1 opening of swmming beaches, refreshment stands, and rowboat rental operations. Parks are open to the public from 8:00 a.m. until 8:00 p.m. in May and from 8:00 a.m. until 9:00 p.m. during the summer season.

HISTORY

The North Carolina State Park System was established in 1915 with the acquisition of 1,200 acres around and including Mount Mitchell on the Blue Ridge Parkway. The purchase of this landmark, the highest point east of the Mississippi River, saved from timbering operations the most extensive stand of Fraser fir remaining in America.

Now over 60 years later, the State Park System has expanded to include over 30 state parks, recreation areas, and natural areas covering more than 76,000 acres. Jockey's Ridge, the tallest sand dune on the east coast, was included in the system as a state park in 1975. Efforts to save the 140-foot dune from commercial development were spearheaded by a group of concerned private citizens and supported by the North Carolina Department of Natural and Economic Resources.

Between 1915 and 1973 only 6,600 acres had been acquired for the park system with State funds. The remaining 22,000 acres were gifts to the State from individuals and organizations. The most recent expansion began in 1973 after a record high appropriation of $11.5 million by the N. C. General Assembly for acquisition of state park lands. Another $5.5 million appropriated the following year boosted the park development and improvements program. More parks closer to home, better recreational facilities, better roads, and new interpretive programs in the parks are some of the features more than four million state park visitors annually can expect to discover over the next few years.

The North Carolina State Park System is administered by the Department of Natural and Economic Resources through its Division of Parks and Recreation. Facilities and services offered by the park system are designed to benefit the citizens of North Carolina and out-of-state visitors by serving four basic purposes—recreation, conservation, education, and scientific studies. Visitors are encouraged to seek assistance from park superintendents, rangers, and naturalists who can interpret the environment of the parks and tell how the parks operate to achieve these basic functions.

To fulfill these objectives, the Division of Parks and Recreation has

adopted certain criteria which govern the best use of the lands within the expanded state park system. According to their suitability with regard to recreational potential and sgnificance of natural features, land areas in the park system have been classified as state parks, state recreation areas, and state natural areas.

STATE PARKS

State parks are defined as protected areas providing opportunities for low density recreation that are compatible with the environment of the park. State parks are located demogeographically so every citizen of the state is within a 50-mile radius of at least one state park. There are 26 state parks in North Carolina.

Each park contains at least one outstanding natural feature that makes it unique in the system. Hammocks Beach State Park is the only island park. Accessible by free passenger ferry during the summer months, it has one of the most beautiful and unspoiled beaches on the Atlantic Coast. Pilot Mountain between Winston-Salem and Mount Airy is a classic quartzite monadnock, a mountain of resistant rock that rises 1,500 feet above the surrounding countryside. Medoc Mountain State Park is on the fall line between the Piedmont and Coastal Plain and contains an unusual mixture of plant and animal life representative of both regions.

Sixteen state parks have developed recreational facilities; ten parks are either undeveloped or under interim use development while master plans are being prepared by the Division of Parks and Recreation. Opportunities for recreation vary among the state parks from nature walking, which the average park visitor can enjoy, to the very specialized sports of hang gliding at Jockey's Ridge State Park and friction climbing on the granite face of Stone Mountain. The most popular visitor activities are family tent or trailer camping, lake or river fishing, swimming, boating, sailing, water skiing, hiking and picnicking. Two or more of these activities are available in each state park.

Interpretive programs are geared toward the environment of the park. Through self-guided nature trails, scheduled nature hikes, displays, museums, natural history lectures, and campfire programs the parks' special features are presented to visitors. Some parks have full-time or seasonal naturalists who conduct nature hikes, bird counts, and other activities for interested groups and individuals.

STATE RECREATION AREAS

State Recreation Areas are regionally located to be accessible to as many people as possible. Recreation areas possess features of unusual value for high density outdoor recreational use yet are in natural surroundings. The park system currently operates two recreation areas, Kerr Lake State Recreation Area north of Henderson and Duke Power State Recreation Area on Lake Norman near Statesville.

Both State Recreation Areas offer a wide range of water-related activities including swimming, excellent bass fishing, and boating; and at Kerr Lake, water skiing and sailing. In addition, Kerr Lake State Recreation Area has over 1,000 family campsites within its seven parks.

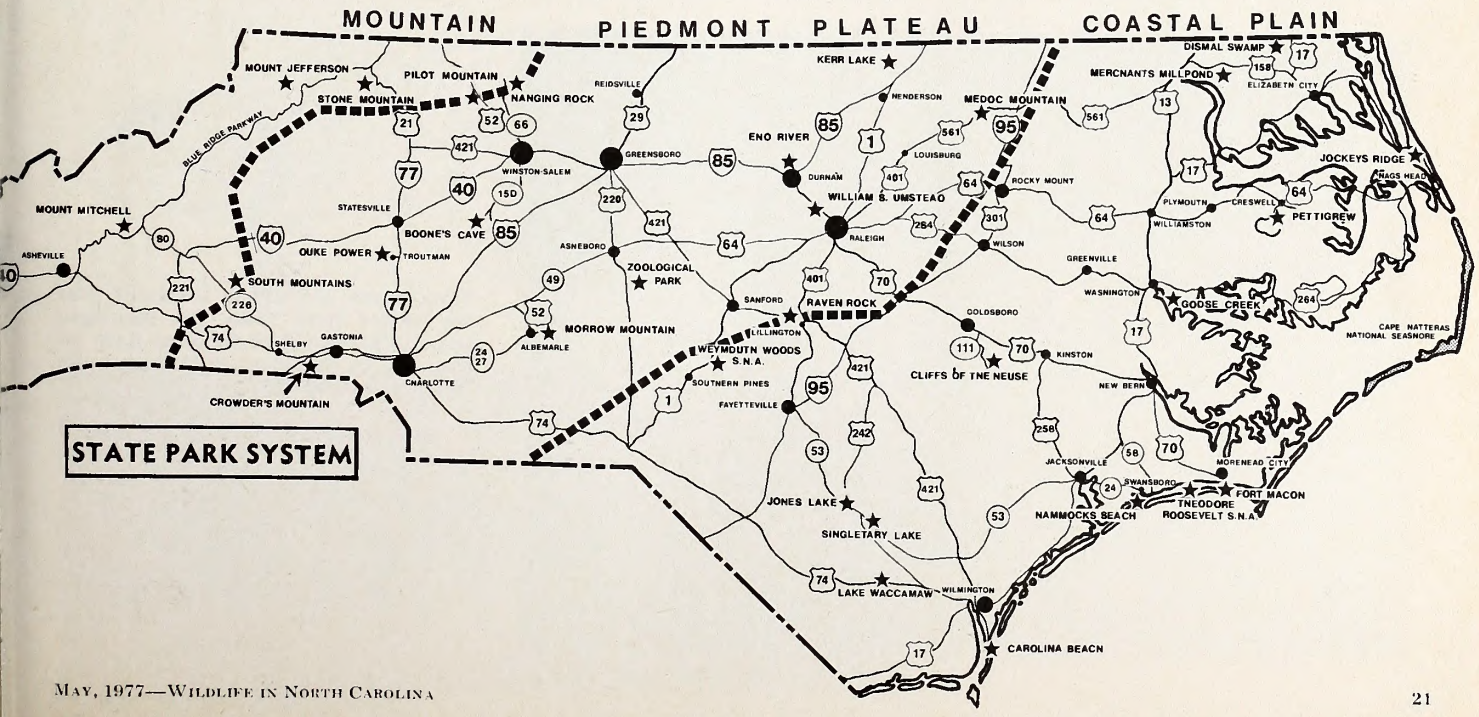
Interpretive programs at the recreation areas highlight the rich Colonial history of the regions as well as the varied plant and animal life.

STATE NATURAL AREAS

State Natural Areas contain outstanding examples of native plant and wildlife or other natural features of scientific importance. Some natural areas support rare or endangered species of flora or fauna. Interpretive features are planned so that the primary natural features of the natural area are not damaged. Recreational facilities are limited to hiking and nature study in the five state natural areas except Weymouth Woods Sandhills Natural Area which has a short bridle trail.

Theodore Roosevelt Natural Area west of Atlantic Beach is known as the home of the alligator. The abundant bird life and unique plant life of this special coastal plain environment attract nature enthusiasts and photographers alike. The Carteret Marine Center within the natural area interprets the coastal ecosystem to visitors.

Hemlock Bluffs, covering 84 acres near Cary, was named for the tall



bluffs on which grow a small stand of Eastern hemlock trees. The hemlock is most abundant in the New England States and Canada. The trees on the Hemlock Bluffs site are believed to be the farthest southeast of the species natural range. A diversity of spring wildflowers, including four species of wild orchids, attract visitors to this small natural area.

The significance of Mitchell's Mill in eastern Wake County, a 67-acre natural area, lies in the presence of a 10- to 12-acre granite flatrock outcrop, which is home for a community of plants that have adapted to the hot, dry habitat of the rock. The natural area serves as an outdoor classroom for science students who study these examples of plants which have adapted to harsh conditions.

The state owns 50 acres on Masonboro Island, one of the coastal barriers islands stretching from Virginia to South Carolina. The undeveloped dunes, marshlands, and coastal vegetation of Masonboro Island are relatively undisturbed, having escaped development by man.

STATE LAKES, RIVERS, TRAILS, AND ZOO

The State Parks System also encompasses the State Lakes, State Natural and Scenic River System, State Trails System, and the North Carolina Zoological Park.

Five of the seven state lakes are associated with state parks. Jones and Salter's Lake are part of Jones Lake State Park. Singletary Lake State Park is used primarily for organized group camping. Pettigrew State Park is on Lake Phelps, one of the largest natural lakes in North Carolina. Land recently purchased on Lake Waccamaw by the State will be developed into a state park.

The New River, one of the oldest rivers in the world, was spotlighted nationally last year when its 26½-mile South Fork was added to the National Wild and Scenic River System by an Act of Congress. This legislation followed an act of the N. C. General Assembly placing the same New River segment in the State Natural and Scenic River System. The State has been seeking to acquire conservation easements along the scenic stretch to protect the natural scenic values of the New River and to provide controlled public access. The Linville River, which flows through Burke and Avery counties near the Blue Ridge Parkway, is the only other river now in the Natural and Scenic River System although several other rivers proposed for inclusion are being studied by the Division of Parks and Recreation.

The State Trails program, now in the planning stage, envisions a statewide network of trails for use by hikers, bicyclists, canoeists, horseback riders, and off-road vehicle enthusiasts. The Trails Committee, in compiling an ongoing inventory of existing and proposed trails throughout North Carolina, is coordinating its activities with local trail groups, local park and recreation departments, and state parks and natural areas.

The 1,371-acre North Carolina Zoological Park near Asheboro, when fully developed, promises to be the largest total natural habitat zoo in the world. A 40-acre interim facility, which serves as a temporary holding area for 250 animals of 60 species, has been open to the public since 1974. Nearly 300,000 people visited the Interim Zoo in 1976, including 60,000 school children from the state's 100 counties. A portion of Phase I, the African section, is now under construction. It is expected to open to the public in about 18 months when rockwork and landscaping for the animal habitats have been completed.

Admission to state parks, recreation areas, and natural areas is free, but moderate fees are charged for facilities such as camping, vacation cabins, swimming and rowboat rentals. Admission to the North Carolina Zoological Park is $1.00, adults; $.25, two through 15 years; free, school groups and senior citizens.

For detailed information about the North Carolina State Park System and its various programs, write the Division of Parks and Recreation, N. C. Department of Natural and Economic Resources, P. O. Box 27687, Raleigh, N. C. 27611.

This is the first in a series of articles on your State Parks. The June issue will feature Hammocks Beach.

State parks are widely scattered over the entire state from the mountain areas (represented by Hanging Rock on page 20) to the coast with Hammocks Beach shown at left.

THE SCULPIN

Lesser Known Fishes of North Carolina

by Barbara B. Lee

Illustration by Renaldo Kuhler

ANOTHER little fish that you are not likely to catch on a hook and line is the sculpin. Native species average only two inches in length and have no scales. They are occasionally used for bait but are seldom seen because they spend most of their time hiding under rocks. Even when they are in the open, their protective coloration is so perfect that they are difficult to spot.

Since they require cool, swift moving creeks and streams, their distribution is limited to the mountainous parts of the state. Their need for high levels of oxygen makes their presence a good indicator of healthy, unpolluted water.

Examination of stomach contents of freshwater sculpins indicates that although they eat small amounts of green algae, the majority of their diet consists of aquatic insects and their larvae. Large individuals may eat small fishes and salamanders.

During the spring breeding season the male sculpin excavates a chamber under a flat stone. He courts the female, then herds her to the nest site. After the eggs are deposited the female departs, leaving the male to brood and guard the eggs.

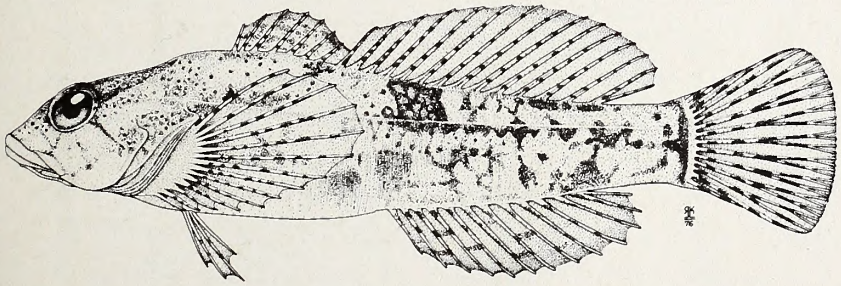
Only two freshwater species of sculpins live in North Carolina, but there are about 300 kinds of sculpins in the world. Most of them live in the ocean, but some also occur in bays and in tidal creeks; relatively few are at home in fresh water. The largest species is the crab eating cabezon, a 30 inch, 25 pound salt water fish found off the west coast. Its flesh is green but is actually very good to eat. The great sculpin, another Pacific species, can move its eyes independently and can make a very loud noise. Another interesting sculpin is the Atlantic sea raven, which, when caught on a fishing line, blows itself up like a balloon by swallowing air.

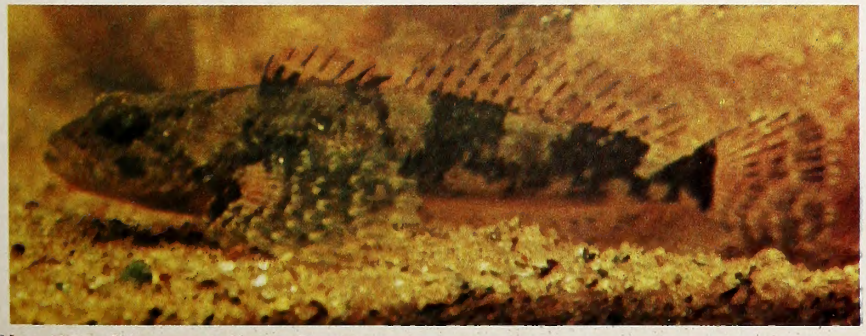
Only one genus, the genus **Cottus**, has been successful in invading fresh water. Our two stream dwelling North Carolina sculpins belong to this genus. The mottled sculpin, **Cottus bairdi**, is by far the most common. It is found throughout the mountains. The banded sculpin, **Cottus carolinae**, is apparently confined to a few North Carolina streams along the Tennessee line. A third species, the black sculpin, **Cottus baileyi**, may one day be discovered in North Carolina, for it is known from the New River drainage just a few miles northwest of the state line.

If you ever do catch a sculpin in North Carolina, you will probably not be able to tell which of the two species you have. Even professional ichthyologists have trouble telling them apart, and the fish keys used for their identification refer to such subtle characteristics as the length and curvature of the preopercular spine and the degree of development of the palatine teeth.

But even with these fine differences, there are problems in identification. Throughout the range of some of the more widely distributed species, characters shift, and fish keys written for Maryland and Pennsylvania, for example, may not adequately separate these same two species of **Cottus** in North Carolina and Tennessee, even though the ecological and behavioral differences support the belief that the fishes are different species. A quick look at the scientific literature shows that even the ichthyologists that named sculpins could foresee such problems, because they gave some of these fishes such scientific names as **Cottus confusus** and **Cottus perplexus!**

Yet even if you can not tell one sculpin from another, they are interesting little fishes which are worth knowing about, and with patience and a sharp eye, you may be able to spot one on your next visit to a mountain stream.





Several species of sculpins range quite widely over North America. The two North Carolina species are difficult to clearly identify and set apart.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Courtesy Motorboat Examinations: CME

The United States Coast Guard Auxiliary is conducting motorboat safety examinations on several lakes over the state. The CME stations give the boater an opportunity to have his boat examined free of charge for safety equipment required or needed. Listed are those CME's which have come to our attention. Check with your local Coast Guard Flotilla for one in your area.

Southmont Wildlife Access Area near Lexington: June 4, 5, 11, 12 (hours not listed).

Lake Hickory and Lake Rhodhiss: June 4, 5, 11, 12; 8 a.m. until noon (no specific location listed).

Lake Norman, Ramsey Creek Access Area: June 4, 5, 11, 12; 11 a.m. until 3 p.m. Saturday; noon until 4 p.m. Sunday.

Guide Service

Coastal fishing will soon be in full swing and vacations aren't far behind. A publication that may help in locating good fishing or a vacation spot is the "N. C. Coastal Fishing and Vacation Guide" available from The Graphic Press, Inc., Box 26808, Raleigh, N. C. 27611. Price is $3.50 postpaid.

Blue Ridge Mountains Conservation Summit

Some 21 classes and field trips highlight the Blue Ridge Conservation Summit for 1977. Conducted by the National Wildlife Federation, this is one of three national summits held this summer. The others, Rocky Mountain and Adirondack Summits, will be held later in July and August. The YMCA Blue Ridge Assembly at Black Mountain, N. C. is headquarters for the Smoky Mountain portion. June 16 - July 1 are the dates. For complete information, write: Conservation Summit, National Wildlife Federation, 1412 16th St., N.W., Washington, D. C. 20036.

Just A Few Left

There are still a few spots for participants in North Carolina State University's Sportfishing Short Course to be held at Hatteras June 19-24. It's a week of high quality instruction in fishing and plenty of practical experience in catching fish in the surf, sound and offshore. For costs and other details, write Denis Jackson, Continuing Education, NCSU, Box 27606, Raleigh, N. C. 27606. Or give him a call at Area Code 919-737-2261.

STEM TO STERN

BY ED JENKINS

• The foundation of any effective safety program must be based upon reliable data. Boating accident reports play a vital role in determining the causes, frequency and location of serious boating accidents. The statistics extracted from these reports are analyzed to aid in determining the direction of measures to deter boating accidents. This month's column is devoted to the statistical report of boating accidents in North Carolina prepared annually by the Wildlife Resources Commission's Division of Boating.

The reason for presenting this type information is not to scare anyone into being a better boat operator or to take the carefree fun out of boating. While there are inherent dangers involved, these are no more impending than those normal to driving, commercial travel, sports, etc. In North Carolina last year, the fatality rate per 100,000 registered motorboats was 26.3 as compared to 33.9 per 100,000 registered motor vehicles. Hopefully though, boat operators will take a few minutes to review this material to get a better understanding of the causes of boating accidents and possibly identify some practices of their own that are reflected in the statistics as being present in many boating accident situations.

State law requires boating accidents which occur on public waters of North Carolina to be reported to the Wildlife Resources Commission if the accident results in one or more of the following:

(a) Loss of life;

(b) A person loses consciousness or receives medical treatment or is disabled for more than 24 hours;

(c) Actual physical damage of $100.00 or

(d) A person disappears from the vessel under circumstances that indicate death or injury.

NORTH CAROLINA BOATING ACCIDENT STATISTICS—1976

	1976	1975	1974	1973	1972
Boating Accidents	197	192	141	142	160
Boating Fatalities	35	58	41	54	61
Boats Registered	164,010	123,391	113,656	104,548	92,607
Boat Law Prosecutions	4,986	2,023	2,911	3,346	3,779
Reportable Property Damage	338,942	539,443	280,224	192,691	300,435

TYPE WATER/FATALITIES

Creek	2
Lake	8
Ocean	5
River	11
Sound or Bay	7
Small Lake or Pond	2

TYPE ACCIDENT/FATALITIES

Falls Overboard	9
Sinking	2
Capsizing	20
Collisions	1
Jumped Overboard	2
Explosion / Fire	1

CAUSE OF FATAL ACCIDENTS

Loss of footing in boat	1
*Loss of footing in boat	1
Walked Overboard	1
*Overloading	2
*Taking on water and waves	2
*Loss of power in rough water	2
Movement of passengers in boat	2
*Boats too small for conditions	2
Ignition of fuel or vapor	1
Heart attack/loss of control of boat	1
Leaned over side/fell overboard	1
*Waves pulled boat from grasp	1
Take on water/movement of passengers	1
*Sitting on gunnel/improper weight distribution	1
Attempt to cross dam in Kayak	1
*Jumped overboard to wade ashore	1
Wake struck boat throwing victim in water	1
Boat swerved/adjusting control while underway	1
Collision with object throwing victim in water	1
Turbulent waters of dam capsized boats	1
*Uncontrolled jibe in sailboat/exposure	1
Improper weight distribution in boat	1
Falls overboard/unknown cause	1

*Weather conditions either caused or contributed to accident.

OPERATION AT TIME OF FATAL ACCIDENT

Fishing	6	Maneuvering	2
Cruising	17	Paddling	2
Drifting	4	Rescue	1
Pulling boat in surf	1	Approaching dock	1
Fueling	1		

TYPE BOAT / FATALITIES

Open Motorboat	21	Canoe	1
Cabin Motorboat	4	Kayak	1
Auxiliary Sail	0	Paddleboat	1
Sail (only)	3	Paddlewheel	1
Rowboat	3		

BOAT SIZE / FATALITIES

16' and under	27
Over 16'	8

OPERATOR'S BOATING EXPERIENCE FATALITIES

Under 20 hours	5
20 to 100 hours	12
100 to 500 hours	8
Over 500 hours	10

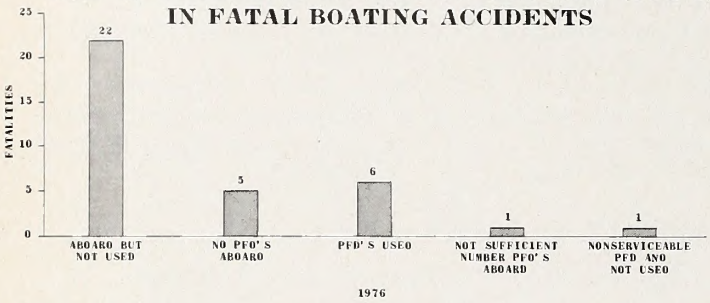
ALCOHOL / FATALITIES

Toxicology tests indicate that one out of every three victims tested had been drinking prior to the accident. Of those who had been drinking, approximately 75% had enough alcohol in their blood to be considered Driving Under the Influence.

ANALYSIS OF FATAL BOATING ACCIDENTS ONLY

Month		Day		Time	
January	2	Monday	8	Morning	6
February	3	Tuesday	2	Afternoon	20
March	5	Wednesday	4	Evening	4
April	2	Thursday	0	Night	5
May	6	Friday	3		
June	4	Saturday	9		
July	3	Sunday	9		
August	2				
September	0				
October	3				
November	2				
December	3				

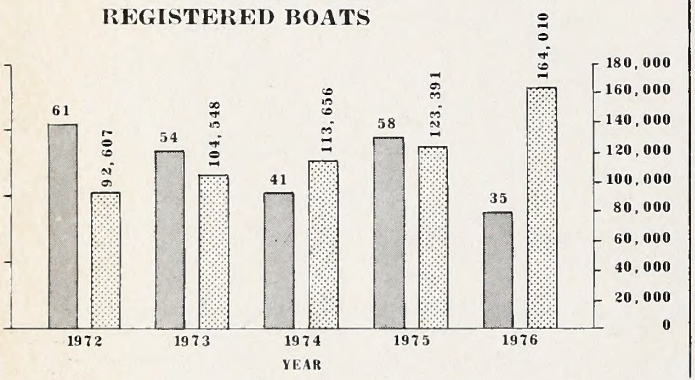
USE OF PERSONAL FLOTATION DEVICES (PFD'S) IN FATAL BOATING ACCIDENTS



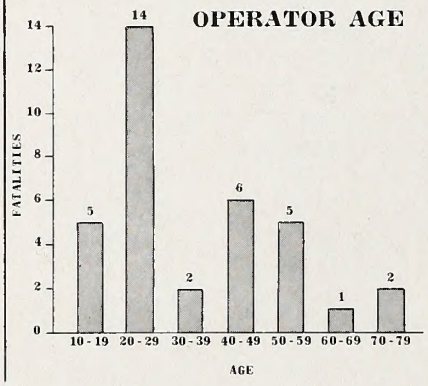
AMOUNT PROPERTY DAMAGE/TYPE ACCIDENT 1976

Fire	$ 84,540.00
Falls Overboard	350.00
Collisions with Other Boats	46,285.00
Capsizings	13,760.00
Collisions with Objects	160,527.00
Mechanical Failure	6,350.00
Sinking/Flooding	26,823.00
Ice Damage	307.00
Total	$338,942.00

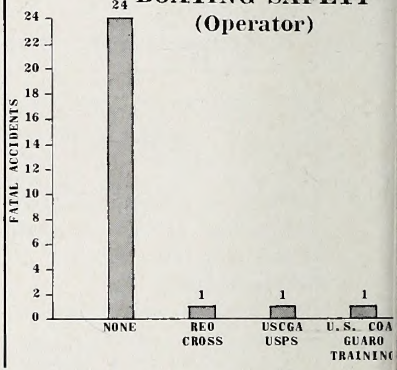
BOATING FATALITIES REGISTERED BOATS



OPERATOR AGE



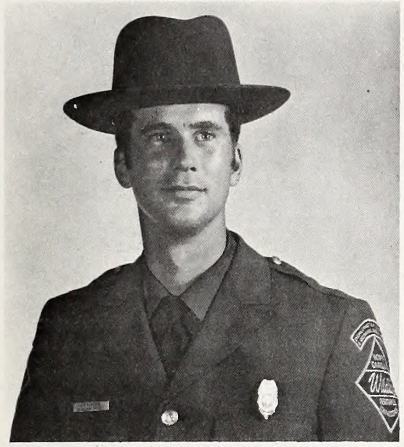
FORMAL INSTRUCTION BOATING SAFETY (Operator)



What could be nicer than a sunny May day, the bass on the prowl and the lake all to yourself? Sounds good . . . But such trips don't always end happily.

A rod and reel and sudden end to his fishing trip were all it cost this wet, but lucky fisherman. Small boats such as this one were involved in many '76 accidents.

KNOW YOUR ENFORCEMENT OFFICER



G. B. Dickinson

George Benson Dickinson was born in St. Petersburg, Florida on June 29, 1948. His family later moved north. After graduating from High School in Houghton, New York George attended Taylor University in Upland, Indiana, where he completed three years as a Business Administration Major, before enlisting in the Air Force. Upon discharge from service, George moved to Walkertown, North Carolina. He attended the three week pre-service school for Wildlife Enforcement Officers in January 1974.

George was employed by the Wildlife Resources Commission August 1, 1974, and was assigned to Rockwell, North Carolina with a work area in parts of Rowan and Davidson Counties. He is married to the former Brenda Gail Stephens from Lumberton, North Carolina. They attend the Rockwell Christian Church, Rockwell, N. C.

George attended the nine-week in-service training school for Wildlife Enforcement Officers in July and August of 1975 at the Institute of Govt. in Chapel Hill. Since employment with the commission he has been interested in all phases of his job and has appeared before numerous schools, civic groups, and organizations etc., discussing conservation, boating safety, hunting, fishing, and trapping laws and regulations. He is a member of the Rowan County Peace Officers Club, North Carolina State Employees Association, and The North Carolina Law Enforcement Officers Association.

ENFORCEMENT RECORD FOR FEBRUARY, 1977

HUNTING AND FISHING	
Persons Checked	8,464
Total Prosecutions	601
Total Convictions	521
Total Fines Collected	$13,564.00
Total Costs Collected	$11,924.50
BOATING	
Persons Checked	1,206
Total Prosecutions	55
Total Convictions	50
Total Fines Collected	$ 105.00
Total Costs Collected	$ 837.00

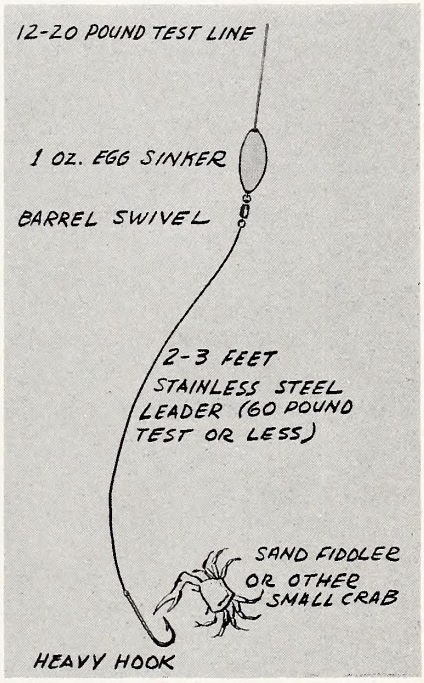
All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

• SHEEPSHEAD from page 11

it's almost assured your bait has been taken undetected. Try all sides of a piling and don't hesitate to move from piling to piling if one is unproductive. If you've had no bites or haven't boated any in 30 minutes, try elsewhere.

Most sheepshead fishermen skin the fish and bake them if the catch is large fish. Frying is also popular, but either way they are delicious. You'll occasionally pick up a tautog when sheepshead fishing and they must also be skinned.

If you're in the coastal area, give sheepshead a try. They're a difficult to hook and gamey fish, but be cautious. If you try them you may get the bug and find yourself tied up under a shady pier or bridge fighting a little known but tough customer.



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BLUETS

Photo by Rhoades Robinson

Most bluets aren't exactly blue, but they certainly aren't normally white either. This unusual clump presented both shades.

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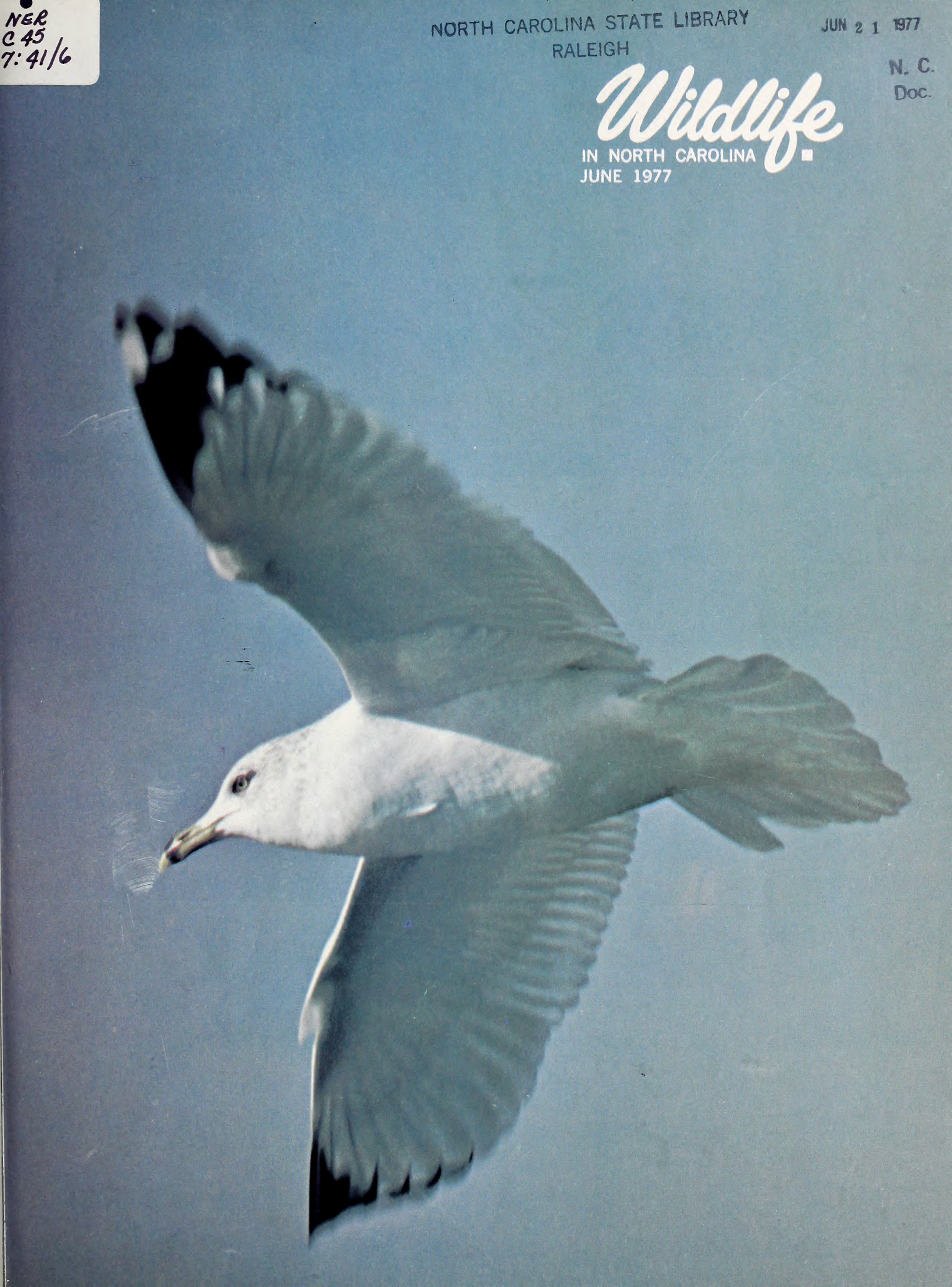

Photo by Leonard Lee Rue III

Three's a Crowd

The adaptable opossum seems to get along in just about any situation that Nature can throw at it. Patient mamma hauls three of her brood. Good thing the whole family isn't aboard!

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VOL. 41, NO. 6 JUNE, 1977

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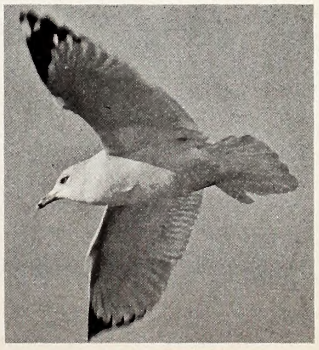
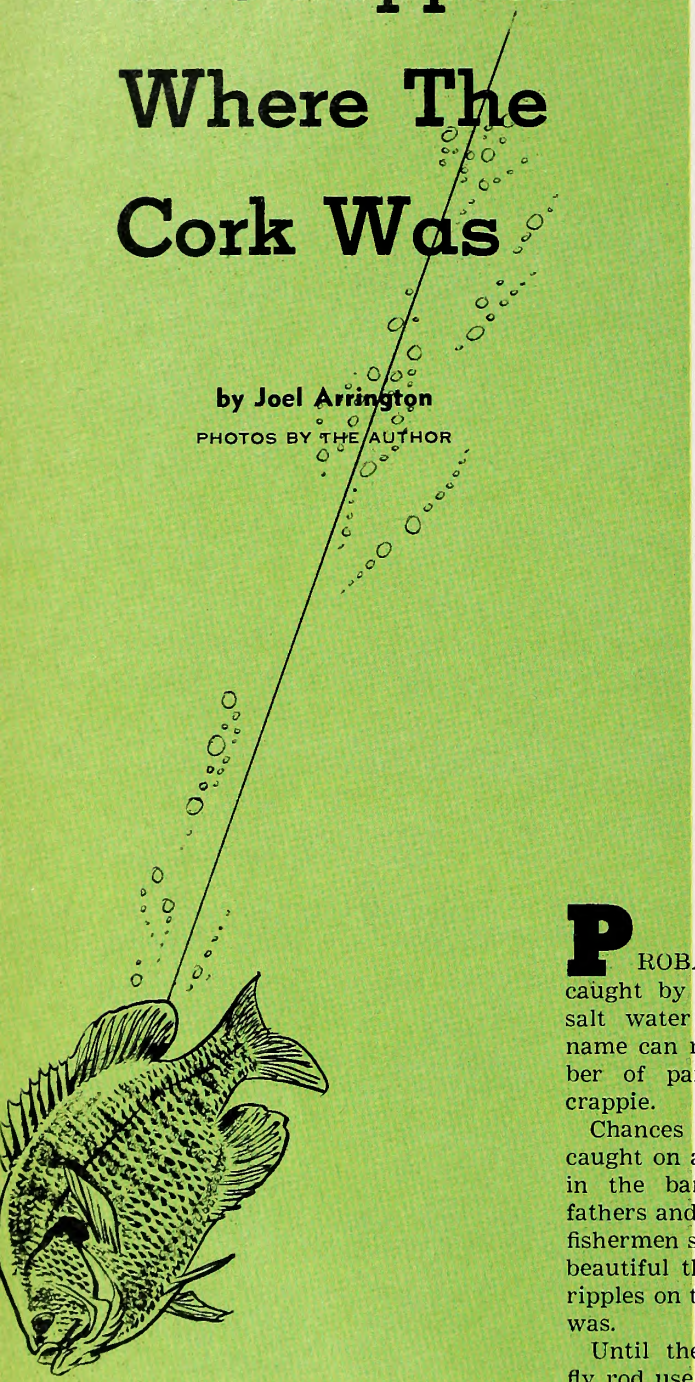


Herring gull or ring-bill? The adults are difficult to tell apart, particularly at a distance. The band on the forward section of the bill indicates that this one is a ring-billed gull. It is most frequently seen in the winter along our coast, and may drift inland at times. Like many of its close relatives, it is primarily a scavenger, constantly on the lookout for food. Photo by Chris Marsh.

The Ripples Where The Cork Was

by Joel Arrington

PHOTOS BY THE AUTHOR



PROBABLY the first fish caught by most anglers inland of salt water was a "bream." That name can mean any one of a number of panfish, from bluegill to crappie.

Chances are, that first fish was caught on a cane pole with a worm in the barefoot tradition of our fathers and grandfathers. Cane pole fishermen still believe that the most beautiful thing in the world is the ripples on the water where the cork was.

Until the advent of widespread fly rod use in this country, panfish were not considered worthy of mature anglers' efforts. They were the quarry of minors and other less sophisticated fishermen. But as long rods and small popping bugs became more popular, seasoned anglers went back after bluegills — the bib overalls, sit-on-the-bank, lazy-summer-afternoon fish of their youth.

The bluegill probably provides more sport for more anglers than any other single species of fish in the world. While its original range included most states east of the Mississippi, it is now widely distributed over the nation and abroad. Its remarkable adaptability to a broad habitat range accounts in part for that. In North Carolina, it is found in all fresh water except for cold, fast-flowing mountain streams. It is important in farm ponds because it provides sport and food and because it is forage for stocked largemouth bass.

Bluegills are gregarious spawners. When water temperature reaches about 70 degrees, they crowd together to make "beds"—groups of nests—along shores in still or slow-moving water. They continue to spawn intermittently in to early fall. This schooling characteristic, and the fast fishing it affords, partly accounts for the bluegill's pop-

Favorites of both the cane pole angler and the fly fisherman, the bluegill (left) and the shellcracker or redear sunfish (right) both carry the common term "bream." The bluegill responds to artificials better than his cousin does.

ularity. It is also a terrific fighter for its size. On appropriate tackle it's a thrilling catch.

Insects are the principal food of bluegills throughout their lives, but they also eat fish eggs. Bluegills over a pound regularly eat small fish, too. When the bluegill population is high in a relatively small water body, it may prevent largemouth bass from spawning successfully by eating the eggs and fry.

Bluegills are not usually large. The maximum weight is something over four pounds and the average is less than a half-pound. But they are scrappy bantams when they are feeding actively. They can suck in a rubber-legged popping bug with the most satisfying slurp you ever heard. In mid-summer, fish usually go deep for cool water. At that time they may be caught on worms, grubs, crickets, grasshoppers and a variety of sinking lures on both fly rods and light spinning tackle.

A wide variety of tackle is used for bluegill fishing. The simplest is a cane pole, a float of some kind, and a small hook baited with worms, grubs or insects. Bait is also fished with a rod and reel under a weighted plastic float.

Fly rods provide the most sport, however. Light rods are best. Bluegill specialists prefer one of about seven and a half feet taking a number six- or seven-level line, although many fishermen use the same eight-footer and number nine bug-taper line they prefer for largemouth bass. Leaders are often five to seven feet long, either level or tapered.

Bluegills are not finicky about lures when they are actively feeding. Small popping bugs in a variety of colors and patterns (but most often predominately white or yellow), sponge spiders, artificial ants, nymphs and wet flies are all productive. Small, light-colored streamers work well at times. Dry flies may not be practical, but bluegills will hit them. Usually you get hundreds of strikes once you find the bed. When dry flies become wet and matted with slime and fish blood, they will not float and must be changed. Popping bugs are just as good, if not better, attractors and they float all day. You can catch an unlimited number of fish on the same bug.

Several other kinds of "bream" inhabit the ponds, lakes and rivers of North Carolina. These include warmouths, which are found in muddy lakes, ponds and slow-moving streams. They are mostly sought by bait fishermen, but they readily hit small poppers and spinners. Brilliantly colored pumpkinseeds are caught mostly by bait fishermen but do furnish limited flyfishing. The redear sunfish, also known as shellcracker, is an important game fish and rivals the bluegill in fighting and eating qualities. However, shellcrackers are usually reluctant to take popping bugs, but they especially like artificial ants. Reflex spinners work well at times.

The redbreast sunfish is also known as the robin. In certain coastal areas it is invariably called a "round robin." The species prefers streams, although it thrives in some ponds and lakes. The green sunfish and the flier are common, but of less importance than most panfish. Few adults weigh much more than a half-pound. The rock bass is a cool-water species common in the New River watershed and in the larger streams of the Little Tennessee River system. The Roanoke bass is very limited in its range, but is a fine game fish.

Two species of crappies occur in the state. Black crappies are native and white crappies were introduced from their original range in the central Mississippi Valley and Great Lakes. Crappies are early spawners, usually beginning when water temperature gets to about 65 degrees. This, together with their great propensity to school, makes them ideal for early spring fishing trips. The fastest way to catch crappies is with a small live minnow on a light-wire hook, but many minnow-like artificials pay off also.

White and yellow perch are also important panfish. Both species prefer natural baits, but they may be taken on artificials. White bass have been introduced to many impoundments where they gather in large schools. When surface temperatures are cool, both in spring and fall, white bass feed voraciously on the surface, making for exciting "jump" fishing. You spot breaking fish and run your boat toward them, casting small spinners and spoons ahead of the school.

Chasing white bass by boat is a long way from that first "bream" most of us caught in our barefoot days. We put aside our cane poles when we were fitted with our first pair of long pants. Now we find most satisfying a sucking slurp and the ripples where the popping bug was.

A Bird in the Hand

by Charles R. Blem
Virginia Commonwealth University, Richmond
Reprinted from "Virginia Wildlife"

EVERY spring I receive many telephone calls requesting information on the care and feeding of nestling birds. I always warn the caller of two things: (1) it is an infraction of both state and federal laws to keep any wild bird except starlings or house (English) sparrows, and (2) even with the most conscientious care, chances of a young bird surviving human captivity are low.

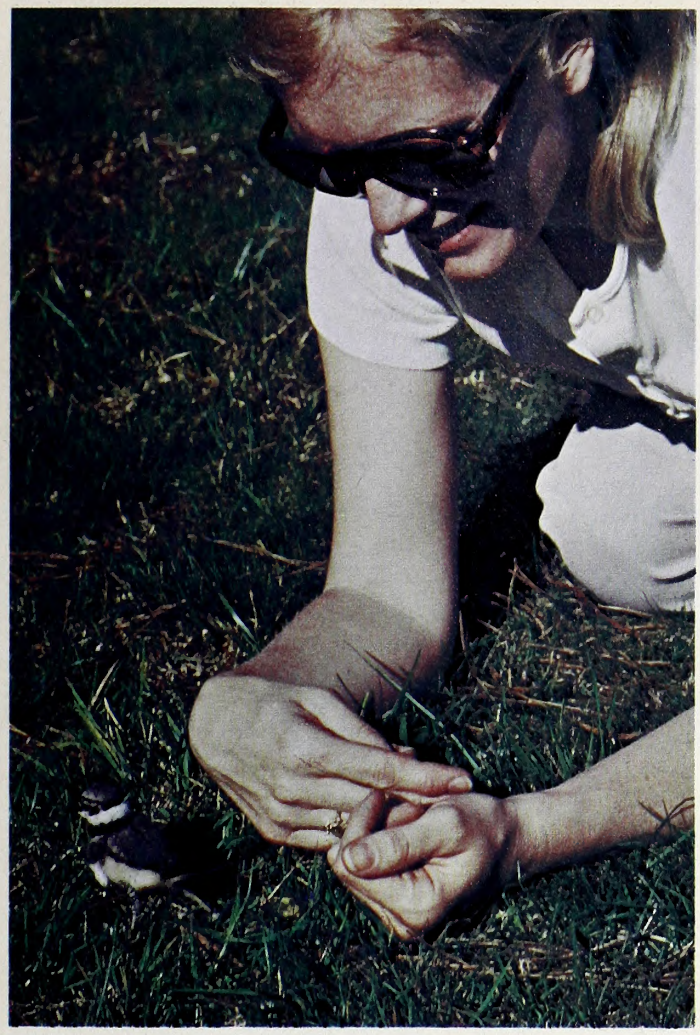
Before attempting to care for a young bird, every effort should be made to determine that it has really been abandoned. Returning a young bird to its nest, replacing a nest and young to their original place in a tree, or simply placing a well-developed young bird in a concealed place in a tree may be enough to allow the parents to return and resume their duties. Young birds that you touch will not necessarily be deserted by the parents. Most often adults will abandon the young only if you frighten them from the nest or if they see a human handling their young. Older nestlings are less willingly deserted than eggs or very small nestlings. The adults cannot "smell" or otherwise detect your odor on the nestling. In fact, the parents may come from quite a distance to care for their young.

The raising of young wildlife in captivity is difficult and it may be illegal. It is a task to be undertaken only when you simply must try it. If it is a protected species (which is just about everything), make sure you have a permit from the Wildlife Resources Commission.

If you have positively determined that the parents are not going to return to their young, then you should assess your chances of hand-rearing the bird. If it is obviously sick or injured, the most humane thing may be to put it to sleep with chloroform or ether. It is really unwise to nurse a sick bird back to a state where it may be released to further spread disease or parasites. Broken bones are especially slow and difficult to heal. Also, very young birds whose eyes have not yet opened are quite fragile and only survive with considerable care and luck. If you still decide to try to save the young bird, the following suggestions may be of some help.

Keep the bird in a clean container so that he will not escape and be injured. A small cardboard box will be sufficient for very young birds. The container may be lined with cloth or toilet tissues so as to maintain a clean nest. Very young nestlings must be kept warm. Usually a desk lamp or other light bulb of low wattage (25W) will provide sufficient heat. Do not place the bird directly under the light. Very small nestlings may be covered loosely with cloth or tissue, and are best kept at 95°F or slightly warmer. Place the lamp at one end of the box so the birds can adjust its temperature by changing position. Older nestlings require less heat and may become active. These should be provided a perch and may be given their freedom to exercise in a screened porch or the like. Hand-reared birds are slow to fly or learn to care for themselves. Exercise in larger spaces may encourage independence.

Most songbirds may be reared on a variety of foods. The most easily



Although many young wild things are surprisingly durable and will withstand moderate handling, they must be kept warm when very young, and they must have the correct foods. It's so far, so good for this young robin (above) and the infant killdeer.

obtained food is regular dry dog or cat food. The pellets should be softened with water and sprinkled with a vitamin supplement. Addition of vitamins is essential, no matter what the diet, and may consist of commercial bird vitamins available at pet shops or from veterinarians. We have hand-reared nestlings on a special diet composed of the following: ½-cup wheat germ; 3 hard-boiled eggs with shells; 2-cups turkey or chick starter mash (medicated); 2 fourteen-ounce cans of cooked horse meat (available at the dog food shelf at your grocery); ½-ounce of vitamin supplement (Squibbs Vionate powder is excellent); 2-ounces molasses; ¼-cup finely crushed oyster shell. Mix ingredients together in a blender or force them through a food grinder and mix. This makes about 3 quarts which we divide into portions and freeze until needed. We occasionally add finely ground raisins and/or a cup or two of a dried commercial preparation of "flies" sometimes sold as turtle food.

Young birds should be fed by forceps or tweezers as often as they beg for food (open their mouths and call). This will be every 20 or 30 minutes during the daytime for very young birds, less often for older birds. Young birds need not be fed at night. Older nestlings should be given live insects or fruit and encouraged to feed themselves. A source of live mealworms is especially helpful at this time. These can be obtained at pet shops, and a colony may be started at home in a container of corn meal, bran or oatmeal. You need not give the young bird water, as the moisture in the food should provide that. Older nestlings will occasionally take a drop of water from your finger, but do not put it in their mouth with an eyedropper as you may choke them. Bread and milk, strict diets of earthworms, or seeds are all nearly useless as diets for very young birds.

Young quail or ducks are relatively easy to care for as they will feed themselves, and a diet of medicated chick starter mash or commercial game bird starter is readily available at feed stores. Conversely, shorebirds such as killdeer may be quite difficult to raise. The mix described above for songbirds is satisfactory, but must be hand-fed to the chick for a while, and supplemented with a variety of flies and worms. Fish-eating birds such as herons or kingfishers will readily take small fish. The fish should be small enough to be swallowed whole (including bones and the digestive tract) and should occasionally be sprinkled with vitamins. Young birds of prey (hawks and owls) may be raised on small whole mice, parts of freshly road-killed animals or chicken parts (particularly the necks). The food should include hair, digestive tract and small pieces of bone, as young hawks and owls seem to require such roughage for normal digestion and as an added source of minerals. Young hawks are particularly difficult to raise. Further detail about caring for a variety of birds may be found in the books, *Bird Ambulance* by Arline Thomas (1971), and *Enjoy Keeping Wild Pets* by Rosemary Collett (1970).

The Wild Turkey in North Carolina

by Rosemary I. Waldorf

THE wild turkey's eyes fix on the clearing's edge, his gobbling stops, his body stiffens and majestically expands as his golden-chocolate-brown back feathers rise like the fur on an angry cat.

The snake-like neck arches the naked bluish head backwards, as its fleshy wattles quiver and become engorged with blood. The black tips of the massive, grayish wings sweep down to touch the ground. The mottled brown tail flies erect and spreads into an even, full fan. The tom has an audience of two for his grand display. At the fringe of the woods, a hen feigns indifference to the spectacle by pecking at insects and scratching at cow chips.

A hunter, no doubt as excited as the old tom, arose early to do some pre-season scouting. He lies behind a fallen log, wearing faceblack and drab, noiseless clothing. He has no gun—if he is honest.

The time: daybreak, late March or early April.

The setting: a half-acre clearing with grasses and weeds.

The occasion: mating. When the tom's show is over, the hen unveils her interest. Meanwhile the hunter makes mental notes of the time, the place, the sound of the hen's love yelps, and hopes that this gobbler will not have changed his habits by the time hunting season opens.

Unless you are an avid turkey hunter, a naturalist or a country boy who spent half his childhood in the woods, you have probably never even seen a wild turkey, much less this elaborate mating ritual.

North Carolina's current wild turkey population of 5,000 is "quite dangerously low," said Neal Weakly, a physiology professor at the University of North Carolina. Weakly is president of the North Carolina Chapter of the National Wild Turkey Federation (NCC-NWTF), an organization of hunters and turkey experts which advocates the conservation and careful management of the wild turkey.

This State's turkey population is, in fact, the lowest in the Southeast. Neighboring Virginia and South Carolina have 25,000 and 12,000 turkeys. Florida's population is stable at 80,000, Alabama's at 200,000.

North Carolina's fragile population exists only because in 1971 the N. C. Wildlife Resources Commission (WRC) launched a vigorous effort to restore the wild turkey to its potential habitat. Since the state chapter was founded about two years ago, NCC-NWTF's 250 members have assisted WRC's restoration efforts.

The Wildlife Commission lured Wayne Bailey, a recognized turkey biologist, from West Virginia to mastermind the state's turkey management program. In "The Wild Turkey's Management and Future in North Carolina," a booklet Bailey wrote explaining WRC's plans and policies, he described current regional wild turkey populations:

— **Northeast.** "Fair" numbers thrive along the Roanoke River in Bertie, Halifax and Martin counties.

— **Coast.** The only thriving population is at U. S. Marine Corps Base, Camp Lejeune.

— **Piedmont.** Scattered flocks exist in eastern Guilford, northern Alamance, northern Lee and Chatham counties. Overall the turkey population has declined since 1955 as the human population has risen. Forests have been fragmented by harvesting as the area became more urban. Bailey and Weakly agree that the Piedmont turkey is doomed, except in protected and managed areas, primarily on the 13,000-acre Caswell and New Hope game lands and adjoining forests.

— **West.** Massive timber operations at the turn of the century

wiped out most of western North Carolina's breeding stock, according to Larry Warlick, former WRC Game Division's assistant chief for operations. Yet because this area includes the Pisgah and Nantahala National Forests — over 700,000 acres, most of which is suitable turkey habitat — it offers the main hope for increasing the state turkey population.

WRC workers have live-trapped and relocated over 250 turkeys to 13 mountain counties, always with the approval and sometimes the assistance of local landowners, Warlick said. Because the turkey is a wide ranger, WRC requests landowners to regard him as a welcome visitor, not as a trespasser who may be shot in season or out.

"By the time this project ends, we hope that the wild turkey may be found on all land which offers suitable habitat," Warlick said. Similar relocation projects have succeeded in several states, including Virginia, whose population made a dramatic comeback in 20 years.

The main cause for Warlick's and Bailey's optimism is this: since much of the available turkey habitat in western North Carolina lies within national forests, management of the area can be founded on more than sheer economics. Whenever U. S. Forest Service officials consider selling timber, WRC personnel go afield to inspect cutting plans and their potential effects on wildlife. "The forest service people can usually be persuaded to modify detrimental plans," Warlick said.

Such restocking plans do not, however, operate in a vacuum. Many forces, natural and unnatural, intentional and accidental, will continue to work against the turkey's welfare.

The turkey has defenses against his natural predators. He has superb camouflage, eyesight eight times as keen as man's and hearing five times as acute. The turkey can be motionless in danger, yet he "can run like an antelope and fly like a quail," one hunter wrote.

The turkey's speed and guile do not always protect him from poachers. "Turkey biologists' estimates of the annual illegal kill in North Carolina range from 5-20 percent of the total population," Weakly said. State law levies a $250 fine on turkey poachers, but few are caught. The testimony of private citizens is usually needed to convict a poacher. Unfortunately, not enough wildlife enthusiasts have been willing to become vigilantes on behalf of this game bird.

Members of NCC-NWTF raised money to establish a standing reward of $100 to anyone instrumental in the conviction of a poacher. They also recognize a complication to illegal turkey hunting in North Carolina which Weakly and his cohorts believe they can better combat through education than through threats.

Until 1971 this state had a fall turkey hunting season. Some oldtimers choose to disregard the current five-year-old indefinite ban on fall hunting. Through brochures, slide shows and speaking engagements, NCC-NWTF members hope to erase the vestiges of the pioneer code which holds that anything that walks in the woods is fair game. "Our organization will continue to try to convince those recalcitrants that the new way is the only way that makes biological sense," Weakly said.

The new way is a four-week, gobbler-only hunt in late April and early May, after the peak of mating.

The biological sense is this: the polygamous gobbler struts and displays his wares before as many hens as he can attract, and mates with them all. By mid-April the hens incubate the eggs they have laid throughout the two weeks of mating. Because one tom can father many broods, harvesting males does not affect production.

The tom, unaware that his hens have begun nesting, continues to gobble for favors. The hunter, now legally, may entice the gobbler with clucks on his box call and sweet scales of tube music. He then lies still and hopes that the gobbler's sexual interests will draw him within shotgun range before a movement or an unconvincing yelp frightens the bird away.

Destruction of habitat threatens the turkey far more than does hunting. Essentially, man forces all wildlife into a losing competition for space and land use—residential, agricultural, industrial and recreational. Anyone who doubts that the North Carolina wild turkey is in trouble should note this fact: from 1971 to 1974—only three years—the wild turkey disappeared from nine counties.

How can these inadvertently competing interests — man's and wildlife's—resolve their mutual needs? WRC has stiffened hunting laws and is restocking the mountains. NCC-NWTF is raising money to buy and lease lands for turkey preserves, and lobbies government and industry to influence land use policies. Experts suggest that several areas of man's environmental activity may be planned so as to do minimal damage to wildlife habitat.

- Lumbering should be more carefully managed. In recent decades, huge tracts of old hardwoods have been harvested and replaced by pine "monocultures," or forests of pine trees only. These pine forests, which are harvested in 15-25 years for pulpwood, do not offer many wild creatures adequate shelter and food.
- Highways, which have thickly crisscrossed the land in the last 25 years, encroach on wildlife habitat in two ways. They cut wide swaths through woods and accommodate vehicles which create a regular disturbance. Turkeys flee this noise, even if this means retreating to a less suitable area. Weakly argues that on game lands many side roads should be closed to motorized vehicles.
- Dam construction, whether to generate power, control floods or create recreational space, should be considered for adverse effects on upland wildlife. Watershed management programs might be used instead. If the New Hope Dam area is flooded, as the Army Corps of Engineers originally planned, "Turkey habitat in the Piedmont will be severely reduced," Weakly said.

These are large-scale projects which one person can seldom launch or block. The average citizen concerned about conserving both game land and animals, however, can reach the government agencies which often control these projects. He can also join nonprofit wildlife organizations which work to preserve existing habitat.

Unspoiled lands in North Carolina shrink as signs of urbanization increase. Essentially, WRC and NCC-NWTF advocate careful planning and greater restraint in future development of land which is to serve exclusively human needs. What value will North Carolina place on a resource, wildlife habitat, which is not economically productive?

Hammocks Beach State Park

by Marcia Constantino

A wild, inviting strand bounded only by white, glistening dunes and gently rolling surf attracts thousands of summer visitors to Hammocks Beach State Park each year. The only island park in the North Carolina State Park System, Hammocks Beach with its three miles of ocean frontage is one of the most beautiful and unspoiled beaches on the Atlantic Coast.

Known also as Bear Island, Hammocks Beach lies between Bogue and Bear inlets about five miles southeast of Swansboro. The name is derived from the definition of a hammock as an upraised piece of very fertile land with hardwood trees growing on it. It is 3½ miles long, ¾ of a mile wide, and covers 892 acres.

Two free passenger ferries operated by the Division of Parks and Recreation carry visitors from the mainland to the island. From Memorial Day to Labor Day the ferries run daily making one round trip each hour from 9:30 a.m. until 6:00 p.m. except during inclement weather. The ferry service also operates on Saturdays and Sundays during May, September, and October. For the safety and comfort of all passengers, no pets are allowed on the boats. Since access is by water only, visitors must make their own arrangements to reach the island when the ferries are not in operation. Private boats may be tied up at the ferry dock on the island, or they may be beached at specific locations along the shore.

An introduction to Hammocks Beach and the waters surrounding it begins on the 25-minute ferry boat ride across the intracoastal waterway and salt marshes. The marshes are small islands constructed by the U. S. Army Corps of Engineers. Planted in cordgrass, the marshes provide a habitat for shore birds and mammals and for slow silting in of the channel.

Seasonal naturalists on board relate the history of the park and identify the plant and animal life which visitors can observe during the crossing. The white American egret, Louisiana heron, the American oyster catcher and little blue heron are a few of the distinctive wading birds seen probing the long marsh grass for food or flying low overhead.

Visitors learn that giant loggerhead turtles, an endangered species, lumber onto the beach on warm nights in June to lay their eggs in the sand and disappear back into the sea. People staying overnight on the island during this period are asked to remain quiet and strictly observe all park regulations as any disturbance might cause the turtles to leave, thus aborting their eggs into the sea. Also at night raccoons fish the shore for oysters and clams. the naturalist tells that inhabitants of the maritime forest — rabbits, snakes, wild pigs, and an occasional bobcat—have left their tracks upon the beach, and that herds of deer swim to the island during winter. Visitors are asked to notice the ospreys resting in the cedars along the water's edge and peregrine falcons gliding around the island in search of food. Both species are on state and federal listings of endangered species.

Upon docking, visitors take a ¾ mile walk to the park facilities and beach. Most are impressed by the diversity of plant life growing on the sound side of the island. Live oaks, cedars, yaupon holly, wax myrtle, sweet gum, and groundsel tree are the major species of the maritime forest. The Division of Parks and Recreation, as part of its management program, planted American beach grass to stabilize the larger dunes and keep them from covering the maritime forest. The highest sand dune on the island rises 60 feet above sea level. Average height of the dunes is 35 feet.

Approaching the beach, most visitors are struck by a series of sensory impressions which imprint themselves on the memory, to be recalled again another time. They are impressions of the sights, sounds, smells, and even touch of a unique coastal environment.

...Hooded laughing gulls with raucous cries and much confusion sweeping across the dunes

...Ghost crabs scuttling sideways across the sand and suddenly disappearing into the sanctuary of their burrows

...Shimmering, emerald green sea lettuce trembling in the breeze

Second in a Series

Wilderness camping among the dunes (left) is available at Hammockss Beach Park. Check with park personnel for campsites. Two free passenger ferries (above) make one round trip each hour. A small fee is charged for bathhouse (right) use.

. . . Porpoises breaking the ocean surface in play

. . . Waving sea oats looking like toasted sheaves of golden wheat filtering the sea breezes

Thus, through a kind of sensuous poetry does Hammocks Beach State Park welcome all to enjoy its natural beauty.

Recreation

Largely undeveloped, Hammocks Beach has few man-made facilities for visitors. A bathhouse of weathered wood harmonizes with the surrounding dune environment. There are restrooms, showers and baskets for swimmers, and a refreshment stand. Several rustic picnic tables sheltered from the sun's rays are located nearby.

The opportunities for recreation result naturally from the park itself—hiking, nature study, fishing, swimming, shell collecting, and wilderness camping.

Very often hikers among the dunes are presented with an unexpected glimpse of nature in action. Terns flying noisily overhead will warn visitors away from egg-filled nests and tiny, newly hatched speckled chicks. A wet meadow around the embayment on Bogue Inlet is covered with wildflowers in fall, a pleasurable sight to weekend visitors.

Fishing on both the sound and surf sides of the island is excellent. Channel fishermen can expect to catch bluefish, flounder, speckled trout, hog fish, and croaker. For surf casters mullet, channel bass, drum, bluefish, and flounder are the most abundant fish. Anglers must remember to supply their own bait since none is available on the island.

Park personnel have marked off two swimming areas on the beach. One is protected by lifeguards on duty during park hours. The other area is not protected, and swimming is at the visitor's own risk. Posted NO SWIMMING signs indicate where undertows make swimming unsafe. The park charges a swimming fee for the use of bathhouse privileges — 75 cents for adults and 50 cents for children 6-12 years.

Hunting for seashells is an activity that can be enjoyed by almost any park visitor. Cockles, sea pens, scallops, sand dollars, and moonsnails are plentiful. A lucky shell gatherer can often find razor clams and angel wings in perfect condition. The extremely fortunate may find a well preserved Scotch bonnet, North Carolina's state shell.

Wilderness camping among the dunes is available to those hardy families and individuals who do not mind doing without the comforts of home. Campers are charged $1.00 per night for up to four people and 25 cents for each extra person. Youth group organizations and their leaders may camp for a daily fee of 20 cents per person with a $2.00 minimum. Group leaders should make advance arrangements with the park superintendent. All campers will need to bring water containers which they can fill at the bathouse.

History

The history of Hammocks Beach State Park is as colorful as its scenery. Originally called Bare Banks, it was one of the first barriers islands, or "Sand Banks," to be given a specific name in the Colonial Records of North Carolina.

Bare Banks was first owned by Tobias Knight, private secretary to Royal Governor Charles Eden, who took out a land patent for the entire island in 1713. Knight reportedly was involved with the infamous Blackbeard and other pirates, but the only treasure on the island is the treasure that nature has bestowed for the pleasure of all.

During the War Between the States, Bear Island and the White Oak River was the boundary between the Union Forces on Bogue Banks and at New Bern and the Confederate Forces occupying Wilmington and Jacksonville. The Confederates had built a six-gun fort on Huggins' Island to protect the entrance to Bogue Inlet and placed pickets on Bear Island, but the fort was evacuated and burned in 1862. The only attack on Bear Island occurred in March, 1864, when a Union gunboat entered Bear Inlet and burned a boat containing a cargo of salt and leather. The Yankees landed on the island and rescued 43 slaves who were hiding out there.

Bear Island for centuries has also been a witness to another battle, that of man against the sea. For the island is part of the Outer Banks of North Carolina, that changing and shifting sand barrier which has been the bain of sailors since the earliest New World explorations. The Banks are called the Graveyard of the Atlantic, and from Currituck to Cape Fear the sea is littered with the wrecks of hundreds of ships lost through the years. Though many of the ships

• **continued on page 27**

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Hunting Regulations on the Way

The Hunting and Trapping Regulations for 1977-78 have been formulated and the printed digest of these regulations will be in the hands of hunting and fishing license agents by mid-August. These do not include migratory game regulations which will be announced later.

Final Steel Shot Regulations Announced for 1977-78 Season

Steel shot zones for waterfowl hunting in 13 states of the Atlantic Flyway States and 12 Mississippi Flyway States are described in the final regulations published in the April 18, 1977, Federal Register by the Interior Department's U. S. Fish and Wildlife Service. North Carolina's zones are as follows: 1. All waters (including sounds, lakes, ponds, marshes, swamps, rivers, and streams) of Currituck, Dare and Pamlico counties and within a 150-yard zone of land adjacent to the margins of such waters in these three counties. Drainage ditches and temporary sheet water more than 150 yards from the waters described above are excluded from the steel shot requirement.

2. The waters of the Cape Fear River and its tributaries in New Hanover and Brunswick counties and a 150-yard zone of land adjacent to the waters of this river and its tributaries in these two counties.

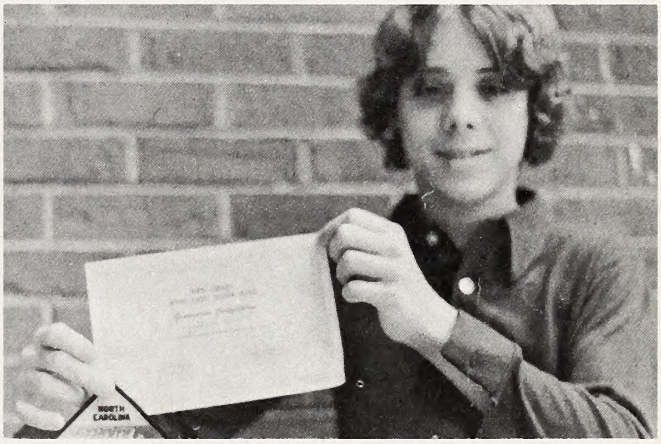
Safe Boating Week

July 3 through 9 has been designated National Safe Boating Week. We hope that you will observe this event every week in the year, and with a special observance during the designated week. For an Action Manual listing literature and program material available, write George Rounds, Chairman, c/o National Association of Engine & Boat Manufacturers, PO Box 5555, Grand Central Station, New York, NY 10017.

Special Canoe Event

Raven Rock State Park and the Carolina Canoe Club will sponsor a canoe handling training session on June 4 (at farm pond near the Park), followed on June 11 and 12 by a canoe trip weekend. For more information, phone Raven Rock State Park, AC 919, 893-4888. The Park is located near Lillington, N.C.

The firing range of the Catawba Valley Rifle and Pistol Club (above left) is closely supervised. M. W. Jones checks the score during a range session (above right). It was a big day for Randy Ballard (center, below) who was number 50,000 to pass the requirements of the Wildlife Resources Commission as a hunter safety graduate. At left is instructor Ken Simmons, and at right, instructor George Nazarovitch.



50,000 Safer Hunters

by Ken Simmons

"Okay gentlemen, the rifle range is no longer clear. Load one round into your rifle and fire at your target."

Thus with these words heard nearly a year ago at the Catawba Valley Rifle and Pistol Club, began an interesting experience for a group of boys from St. Stephens High School's ninth grade physical education classes.

This trip to the firing range was part of the Hunter Safety Program sponsored by the N. C. Wildlife Resources Commission. St. Stephens started the hunter safety program only two years ago, but the statewide program has been in progress for five years.

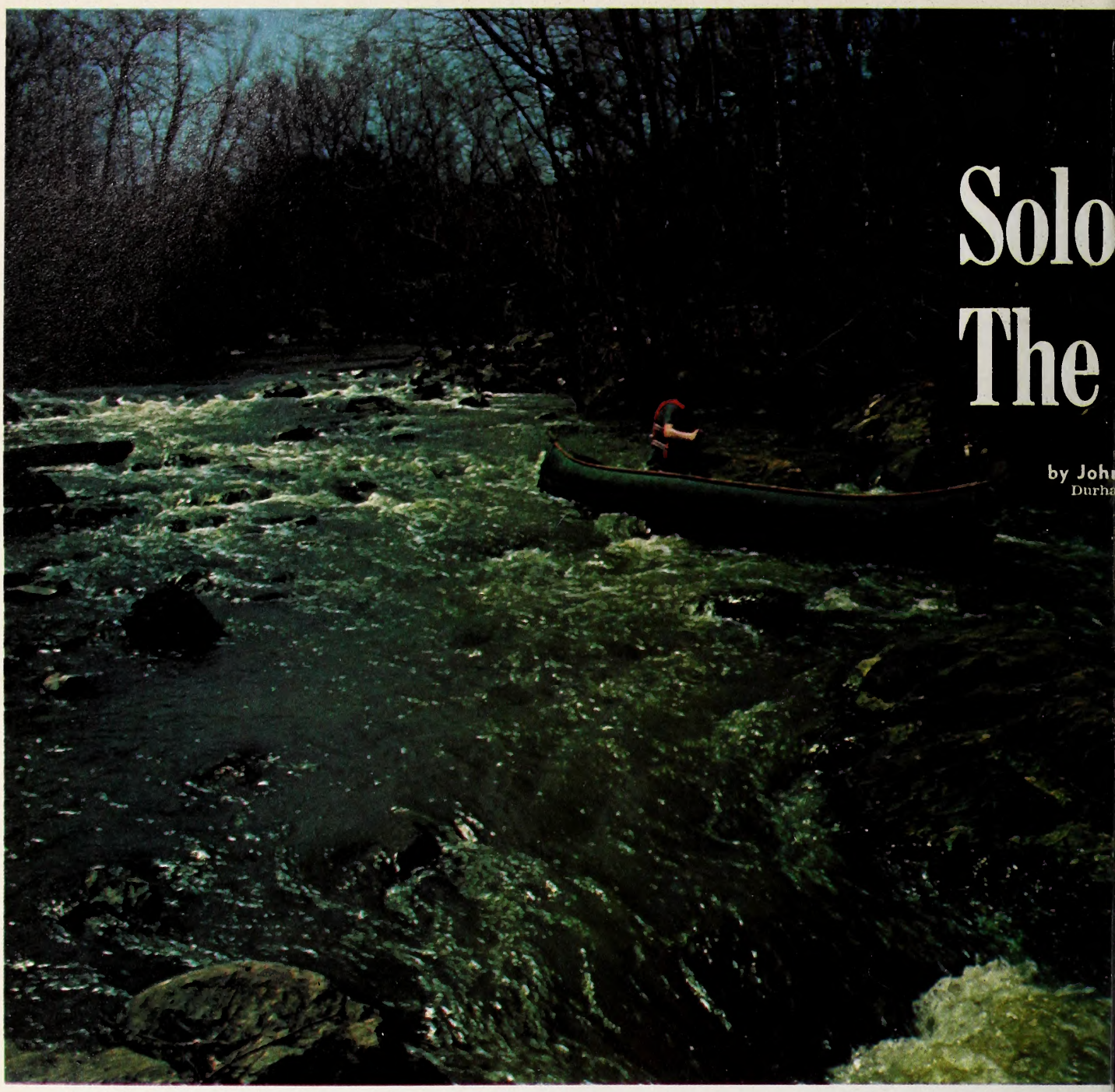
Mr. R. Lyle Morgan, hunter safety officer for 35 counties in western North Carolina, brought booklets and various tests to St. Stephens; instructors George Nazarovitch and Ken Simmons taught the course. The course required five hours of classroom work, followed by the trip to the rifle range.

One participant, Randy Ballard, was student number 50,000 to pass the requirements for the hunter safety graduate.

Statistics have shown that students who passed this test have a much lower hunting accident rate compared to hunters who have not been exposed to any form of hunter safety instruction.

Mr. Simmons added, "I would like to express our appreciation to Mr. W. M. Jones of the Hickory National Guard and to the Catawba Valley Rifle and Pistol Club for their cooperation and interest."

"Some of these students had never fired a rifle before today and we hope that we have instilled in them a respect for, and an understanding of, firearms. With our population increasing as it is, the dangers of improper use of firearms increases. We feel that the Wildlife Commission's Hunter Safety Program has helped to greatly reduce the chances of an accident occurring.



Solo
The

by Joh
Durha

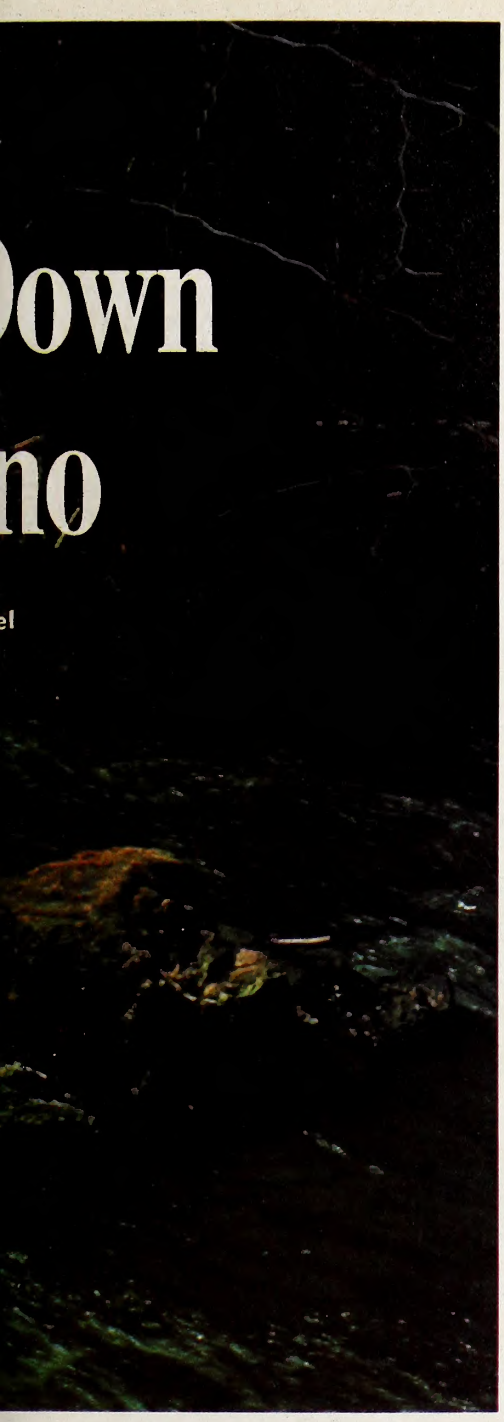
SCANNING the river from the Cole Mill Road Bridge, I begin to question the wisdom of canoeing the Eno alone. The current is high and moving fast as a result of Friday's rain. Still, the muddy waters are below the banks and will probably drop as the day goes on. My girlfriend, Cathy, glances worriedly from me to the river and back again.

"I don't know, John," she says, "it might be a good idea to wait for some other boaters." I ponder the situation for a moment, then walk over to the car to get the canoe.

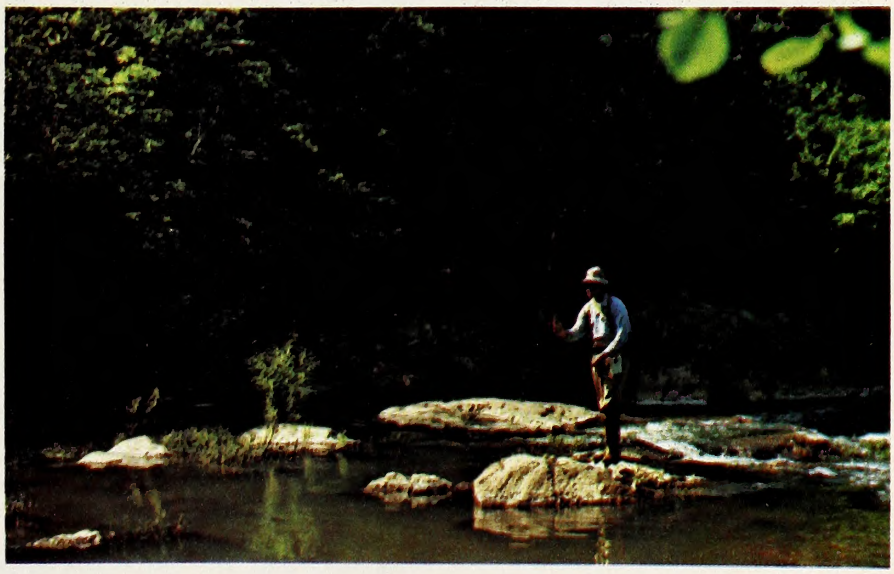
"Maybe," I reply, "but let's put the boat in the water and test the current." We raise the canoe off the racks and carry it down the muddy bank beside the bridge. Cathy holds the boat as I step in and make a check of the equipment—life vest, extra paddle, waterproof duffle bag with dry clothes. Everything is there.

Normally, Cathy and I would both be going in the company of friends, but today everyone, including Cathy, has something else to do. I considered not even coming down to the river, but the urge is too great. It's the first sunny Saturday in a month and there's no way I'm staying home.

I give Cathy a nod and she pushes the bow into the current. My intention is to paddle upstream for a short distance, testing the current and the river depth. If I can maneuver readily against the drift and the water isn't over my head, my worries will be greatly diminished. I won't be in much danger of tipping over, and should this happen, it will only mean wading, not swimming, to shore. I dig the wooden blade into the swirling waters and



Areas such as the Eno are becoming increasingly important as the demands mount for "urban" outdoor recreation. Pressures on many of these fragile spots make it critical that we use them very carefully. The Eno is a relatively small stream and will not withstand a great deal of fishing pressure.



spur my long dormant arm and shoulder muscles to life.

"It's not bad," I shout as the boat moves slowly but steadily forward. Coming to a halt some 20 yards upstream, I shove the paddle straight downwards. It touches bottom with the handle grip above water.

"Not too deep, either," I call out, "it should be pretty safe." Cathy and I share a quick smile and a wave, then I turn the canoe and let it swing downstream with the current. A few seconds later, the banks merge behind me and I am alone.

During most of the year, the Eno River is too low for good canoeing or kayaking. That's a shame because it's a beautiful stream, flowing through largely unbroken forest from Hillsborough east to Durham and beyond. The scenery can be enjoyed by hiking the meandering trails on either side of the river, but today I am glad to be sitting back in a wicker seat with a paddle in my hand. In my opinion, the best view in the park is always from midstream.

As a general rule, one should never canoe alone. The Eno, like any other river, can be dangerous at times, especially when swollen with spring rains. But today, the river is at just the right level—not so deep that you can't walk the boat ashore if you tip over, yet high enough to get you over the rock-strewn rapids that usually hang-up a canoe. And after a winter of confinement to home and office, I desperately need excitement. The chance to extend myself, to take a small risk in search of a big reward, this is what I desire above all else.

It is not long before I hear the

rush of tumbling water ahead. Compared to the marvelous stillness of the surrounding forest, the approaching rapids sound awesome. I stand up in the canoe (another rule broken) and scout the river for the best route. No problem—all the rocks are covered and the total vertical drop looks to be only a few feet.

I drop to my knees and dig the paddle in hard. The canoe slides into the rapid and bounces to life. With the first slap of cold water on my face, I let out a whoop (Thanks, I needed that). The sound, sight, and smell of airborne spray rush together at once, filling me with joy and excitement. A quick dodge to avoid a sinister-looking bulge, a few strokes to straighten out the bow, and I am through—in and out with barely a chance to sneeze. I look upstream to affirm what I sensed was a rock huddled just below the surface. The canoe would have passed over it, but it's always nice to make a clean run.

There are many rapids like this on the Eno—drops of two to three vertical feet spread over a distance of 15 or 20 horizontal feet, each one a puzzle to be deciphered as the boater rushes forward. It's a good river to learn on. There is a good deal of maneuvering to be done, but usually the boater is in no real danger. If you hang-up on a rock, as everyone eventually does, you can get out and work the boat back into position. Wet feet, yes, but danger, no. For the more advanced boater, there's always the opportunity to sharpen his or her skills and enjoy the scenery at the same time.

There is something about the Eno River which makes it more enjoyable to me than its oft-canoed neighbors, the Haw and the Deep. Perhaps it's the size: small and, thus, more personal. The landscape, too, is intricate and varied. From Cole Mill Road north of Durham on down to Roxboro Road, the Eno flows through a narrow, unpopulated valley of remarkable beauty. Here can be found ancient beech, oak, and hickory trees, all perched in full view along the valley walls. Large rock outcropping are also common, some covered with three or four different kinds of lichen and moss.

There are some interesting man-made structures here, too, most notably, the old foundations of Cole Mill which hugs the river beside one of the larger rapids. Wildlife on the Eno is not as abundant as on the larger Piedmont Rivers, but what is there can often be seen at close range. I watched a muskrat scurry down the bank and was surprised several times by wood ducks, bursting from the water with thin cries of alarm. And because the valley is narrow, it blocks out the winds and sounds of civilization, never far away in reality but totally absent in mind.

I have learned, to my amazement, that there are well over a million people living within a 50-mile radius of the Eno. Yet scarcely a house is visible from the water, and even road crossings are few. If the North Carolina State Government has its way, much of the Eno will remain like this forever. Currently, the Division of Parks and Recreation is in the process of buying up land and easement rights to property along the 15-mile stretch from the Route 70 bridge near Hillsborough down to Guess Road north of Durham, including the section I am canoeing. If all goes as planned, the proposed Eno State Park will eventually encompass over 3,000 acres on both sides of the stream. The City of Durham already owns the riverside property from Guess Road on down to Roxboro Road and has recently established a public park there—West Point on the Eno. Although suburban development may someday surround the Eno on all sides, it is relieving to know that efforts are being made to preserve the river valley as it is.

For almost two hours, I alternately glide and paddle over short rapids and intervening calm stretches. Both are equally pleasing to me and, like a good novel, the Eno saves the best for last. I am now approaching the final and most difficult rapid on my run. Before me, the Eno disperses to either side of a small island, tumbling over rocks and snagged logs in a confused pattern. I must bear to the left between two boulders, then make a hard right around a fallen tree and turn back again to the left. The route is tricky but not impossible.

With paddle firmly in hand, I line the canoe up and head into the rapid. The two boulders rush past me in a blur of grey and the fallen tree looms ahead, partially blocking my path. I sweep hard on the left then switch sides, drawing upstream with all my strength. Out of the corner of my eye, I can see the tree rushing towards me, but the boat responds to my urgent paddling. Water bounces off the trunk and splashes into the boat. One more draw and I switch back to the left side with a hard rudder. The boat swings quickly, tipping far to one side, then levels out and bounces over the standing waves at the bottom of the rapid. I search the water ahead for another obstacle, but the coast is clear. I'm home free.

I breathe a sigh of relief and lean back in my seat to drink in the sunshine. The sound of tumbling water quickly fades behind me and is soon replaced by the gentle clapping of the bow against the ruffled surface. This has been the finest day in five months. For too long, I realize, the confines of the man-made world have been my only home. They have given me warmth and comfort, but they have also confined me, deprived my senses of these wondrous sights, sounds, and smells that flow from the land around us. In a strange way, I feel that I am in my true home—one that I cannot always live in, but will cherish and return to whenever possible. This is my heritage . . . it is every man's heritage.

Suddenly, the urgent shout of a child rings out from the bank. I sit up and look around. West Point on the Eno—my journey is over. The heads of picnickers turn toward me from the bank, and behind them, the pale wooden side of the newly-restored West Point Mill emerges from the trees. I ease the canoe toward shore as a small crowd converges on the bank.

"Hey, where did you come from?"

"What's the river like?"

An older man helps me pull the boat ashore and I step unsteadily onto the rocks. I tell the questioners where I started and relate the high points of the trip. Is it dangerous? No, not unless it's near flood stage. Did you get wet? Yes, a little, but that's half the fun.

I could talk for an hour if anyone wanted to listen. I could tell them about the beautiful forest, the moss-lined river with its staircase of rapids. I could tell them about being alone with nature for a day, talking with no one, just listening and watching as the river carries you along. But instead I urge them to get in a boat and see for themselves. The rest of the week, I promise them, won't be quite the same.

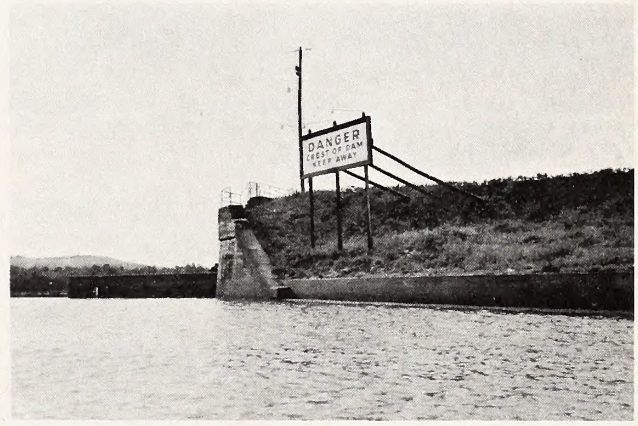
Dam to Dam

BY ED JENKINS

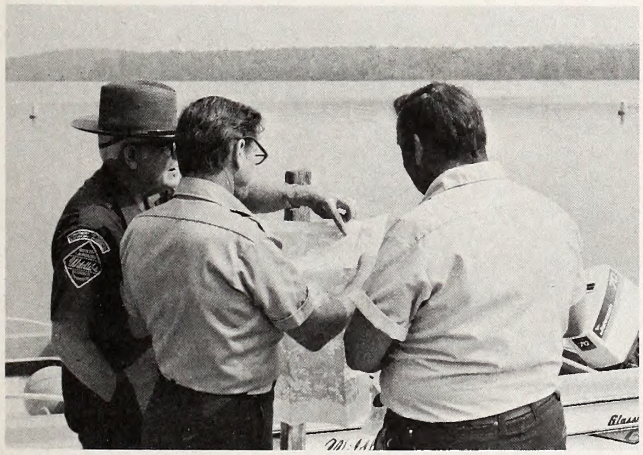
● If one could build a dam across a river and flood the standing timber in the area, place an unmarked floating log boom across the newly formed lake to prevent uprooted trees and logs from floating over the dam, have the water fluctuate to levels that frequently conceal the trees and stumps just below the surface of the lake, then let the word get out about the excellent crappie fishing on the lake, he would come close to duplicating the situation facing boaters on Blewett Falls Lake.

April, 1976—"It's a wonder more people aren't hurt and boats damaged than there are," said Wildlife Officer Ralph Griffin of Wadesboro as we stood on the Pee Dee Access Area looking out at what appeared to be an expanse of excellent fishing and boating water. As a small fishing boat headed toward a point of land to our left, Ralph added "That boat will be lucky to get through there without hitting something." We listened for the anticipated high pitched whine of a racing outboard motor that has just broken its shear pin, but the drone of the motor never wavered. "Water must be up more than I thought," said the enforcement officer as we stepped into the boat Lindsay Everette had just maneuvered next to the dock. Lindsay was the boating safety representative for this area and was here with us to try to determine what could be done to make the lake safer for boaters. On this day we would begin a survey of the lake that would eventually lead to the placement of 18 waterway markers on the lake.

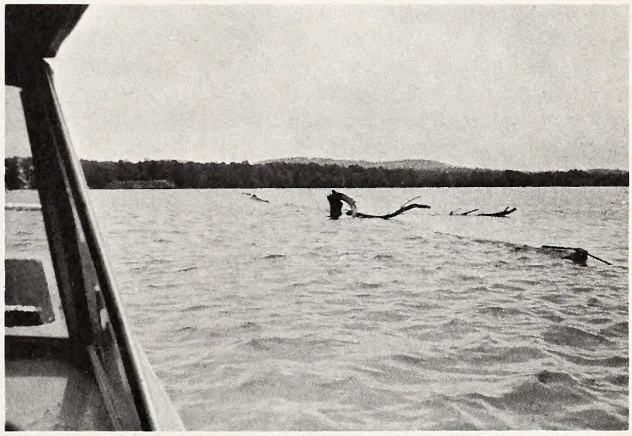
April, 1977—A year has passed since I last was on this lake that separates Anson and Richmond counties. Two crews of workers from the Wildlife Commission's Division of Boating were busily loading their work boats with 2600 pounds of concrete anchor weights, what appeared to be enough cable to reach across the lake, and orange and white six-foot tall buoys. Lindsay Everette, Wildlife Officer Griffin and Roy Lanier, who



The lake survey conducted by boating safety representatives revealed that while a few hazards such as the dam (above) were marked, dangers such as the log boom (below) were unmarked and had a history of accident-causing incidents.



Wildlife Enforcement Officer Ralph Griffin (left), Boating Safety Representative Lindsay Everette (center) and Boating Access Technician Roy Lanier review the location of hazards to be marked on Blewett Falls Lake.



would supervise the actual placement of the buoys, studied the chart of plotted lake hazards that had taken the better part of a year to prepare. Lindsay pointed out to Roy that while the lake survey he conducted found that 25 buoys would be needed to mark the lake hazards, only 18 buoys were available for use at this time. This was certainly not the first time that plans had to be altered because of funding and equipment shortages, and the crew had learned to adapt to last minute changes. Survey notes and charts were evaluated to determine which areas posed the greatest threat to boaters and then we shoved off to place the first group of buoys.

Two hours later the seventh buoy had just been placed marking the area Ralph Griffin and I had watched a small fishing boat miraculously navigate over a year ago. "That ought to do it for this area" Ralph said with a discernable smile of satisfaction on his face as the three Wildlife Commission work boats headed back to the access area for another load of

buoys and to drop me off from my photographing mission.

Before I left the access area headed back to Raleigh, my job completed, the boats were loaded and off again for the next area on Lindsay's survey chart. By the end of the day the placement of the buoys would be over and the crews on their way back home. I knew the lake still had a few more surprises hidden for unsuspecting boaters, but after today Blewett Falls Lake would be safer for all to enjoy.

Once the hazards and potential danger spots are located and marked on lake maps, durable, highly visible buoys with heavy anchors are prepared.

The orange and white buoys are lowered into the water as Roy Lanier maneuvers the boat over each precise location. Watch for these markers.

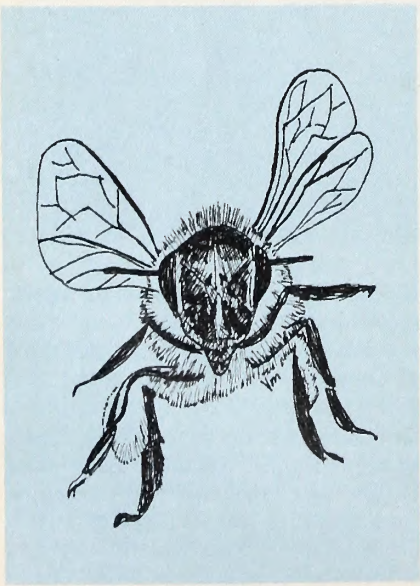
WILDLIFE WAYS

by Margaret Moore

The Grateful Bee

IT was one of those Spring-like days in late February — clear skies, warm sunlight, filled with a promise of rebirth. A few crocus buds dotted the garden, and tiny spears of daffodil, tulip, and hyacinth leaves had pushed through the ground.

I looked upward through the branches of the tall pussy willow tree and felt the beauty of the silver catkins against a pale blue sky. In a few days wild bees would find the tree and imbibe Spring's first offering of a new year's pollen. They come every Spring and stay several days. To modern ears their buzzing sounds like a droning motor and can be heard almost a block away.



Vicki Mercer

But now there was only one bee, and he was not in the willow tree. I followed his flight to a bed of snowdrops. He circled in and out, around and about the long stems of the pristine buds.

"That won't do you any good," I said. "They are all tight buds." I talk to the birds and bees, the flowers, and the squirrels. But not as kindly to the squirrels because they steal the seeds and suet from the bird feeder, and dig up bulbs. But the bee didn't believe me. Confidently he inspected the snowdrop buds, all of them, and finally selected the one most likely to break first. Very carefully he actually pulled back one of the long petals and crawled into the flower which must have offered something tasty for he stayed quite a while. Then he backed out.

It really happened —

— and most of it happened at Poethaven where the author lives in a quaint house with gabled roof and creeping ivy. In an aura of serenity, the house, looking as though it had been designed especially for a poet, and the Flower Cottage next door are located at the base of a half-acre triangle.

Towering spruce, pink and white dogwood, quince, azalea and forsythia, a rose arbor and a fountain, three graceful Lombardy poplars, sasanqua camellia—dozens and dozens of flowering trees, shrubs, and plants — all make a garden for "things to happen."

* * * * * *

Now, I have become accustomed to the unexpected, but what the bee did next was more than unexpected—it was unbelievable. He pushed and pushed the petal gently toward the bud as though trying to put it back in place again, which he did, and then . . .

I wouldn't have believed it if I hadn't seen it with my own eyes.

That bee wrapped his front legs around the snowdrop bud and gave it a little hug.

It must have been for one of two reasons: either he was a conscientious, meticulous bee and wanted to leave things as he found them, protecting a source of food, or, the fresh Spring nectar had tasted so good that he was compelled to express his thanks!

ENVIRONMENTAL TRENDS

ANGLER: "You've been watching me for three hours. Why don't you try fishing yourself?"
ONLOOKER: "I ain't got the patience."

● Like our friend above, not everyone has the patience for fishing. But those who do, share an almost unspoken understanding of the beauty and the challenge of the sport. Whether they go for trout in remote mountain streams or for spot and blues in the sound, all fishermen know the anticipation with each cast, the excitement of a strike and the mixture of weariness and contentment at the end of the day.

But fishing requires more than patience. There must be fish to catch and this happens only where the waters are clean enough to allow the fish to live and reproduce.

In 1972 Congress, concerned about the state of America's waters, passed the Federal Water Pollution Control Act Amendments which established as a national goal "fishable and swimmable waters" by 1983. To meet this goal the Department of Natural and Economic Resources is beginning a statewide study to see where there are problems with water quality in North Carolina and what can be done to correct the problems. The statewide study of water quality is part of the State's "208 Program" which is named for the section of the federal law which calls for the studies.

In the past few years, fish kills in North Carolina rivers have received considerable public attention. Fish kills may result when chemical spills poison the water or when the oxygen level in the water gets so low that fish literally suffocate. The oxygen level drops when organic (oxygen-demanding) waste enters the water in amounts too great for the water to handle through natural processes. The excessive organic waste may come from inadequate or improperly operated municipal or industrial waste treatment plants.

Fish kills are most likely to occur during periods of low flow when the river has less water, coupled with above normal temperatures, and, therefore, less oxygen available to supply both the needs of the fish and the demands of the organic waste. The extreme conditions which result in a fish kill rarely occur and, when they do, usually last for only short periods of time. But the fish are dead. It's the same as someone coming into your home and saying he was going to take away all the oxygen, but for only 10 minutes. During those 10 minutes everyone in the house has the same chance of survival as the fish in the organically overloaded stream — none. In the battle for oxygen, the bacteria in the waste are the winners and the fish—and ultimately, the fishermen—are the losers.

A similar instance can be found on the coast of North Carolina where one-third of all shellfishing areas are closed to public and commercial use because of bacterial contamination. Most of these areas are adjacent to towns, harbors or resorts. The level of bacteria which has caused this problem does not normally occur in bodies of water. It occurs when poorly treated sewage is allowed to reach the water in quantities which it cannot purify through its natural processes. The fisherman, indeed everyone in North Carolina, loses again.

In both these cases, men have acted on the assumption that the water—and the fish and other animals which live in and on it—can tolerate unlimited abuse. Fortunately, North Carolina has not had the unhappy experience of some other states who have found that it is possible to kill practically every organism living in a stretch of river. Some of these states have staged massive clean-up efforts which have restored damaged rivers and lakes. This is a great relief to hunters, fishermen, environmentalists and the general public in those areas but it's even greater pity that conditions were ever allowed to get that bad in the first place. Why harm wildlife, generate hard feelings and expend all that clean-up money when, with some early concern, serious problems could have been prevented. The 208 Program in North Carolina is beginning *now* to look at water quality, especially in areas where problems seem likely, so that the necessary steps can be taken quickly to put the situation right.

Studies may show that some practices on land will have to be modified to ensure a level of water quality which will support fishing and swimming in most waters in the state. North Carolina has the opportunity to act decisively to assure clean water now and for future generations. The opportunity cannot be missed. Benjamin Franklin once observed that everyone knows the value of water when the well is dry.

The 208 Program includes the opportunity—really the requirement—for citizen involvement in the water quality management-planning process. As studies are completed and problem areas identified, citizens

● **Continued on page 27**

Good fishing depends on quality habitat for the fish; water quality in turn depends on the constant surveillance and study of pollution and other water problems.

Lake Mattamuskeet

FOR ALL SEASONS-FOR ALL TIME

by Gary E. Stevenson

PHOTOS BY THE AUTHOR

THE previous afternoon's rain had ended with the passage of a fast-moving cold front, but the early morning sunshine did little to break the numbing cold as we crouched along the edge of the frozen canal. The temperature was in the low twenties and the steady wind made it feel much colder. Huge flocks of Canada geese, whistling swans, and various species of dabbling ducks milled over the marshes, gabbling continuously as they dropped into recently cut corn fields to feed. It was an incredible sight—I wondered how long my film supply would hold out as flock after flock of Canadas flew by so close I could hear the rustling of their wings in spite of the wind.

This is a common winter scene at Mattamuskeet National Wildlife Refuge located in eastern Hyde County, North Carolina. I was visiting the refuge with an advanced wildlife management class from North Carolina State University during the last weekend of January 1977. The refuge, some 50,000 acres in size, is located about 120 miles east of Wilson on U. S. 264. Lake Mattamuskeet, 18 miles long and five to six miles wide, comprises 40,000 acres of the refuge, the rest being marsh (6,500 acres), timber (3,000 acres), and farmland (400 acres). The area is a favorite wintering area for geese, swans, and near unbelievable numbers of ducks.

Finally I put the camera away and got out my binoculars. About 30 acres of corn had been cut a few days before our arrival, and now there was a steady parade of fowl moving between the field and the marshes. Canadas and swans dominated the show, but through my glasses I could make out a good variety of ducks—mostly pintails—the refuge's most common duck. Also numbers of widgeons, mallards, black ducks, and teal spaced between. As I watched, a cloud of white birds rose out of a distant marsh. At first I thought they were swans, but as they grew closer I saw they were too small to be swans—still closer, and I made out the distinctive black wingtips—snow geese. Usually uncommon on Mattamuskeet, the extreme cold had frozen them out of their normal wintering area on Pea Island and driven them here where there was open water.

About 10:30 or so, we all trooped back to refuge headquarters where Assistant Refuge Manager Lee R. Fulton presented a slide show dealing with the refuge's wildlife, operations, and history.

Mattamuskeet is the largest of North Carolina's seven national wildlife refuges. It has long been a mecca for waterfowl hunters—during hunting season the area's entire economy hinges on the influx of hunters, with motels being booked up months in advance. Even though hunting on the refuge itself has been closed for four seasons (more on that in a minute), shooting in the surrounding fields is good.

The lake is like a saucer imbedded in a virtually flat plain. The plain's elevation is less than two feet above sea level, and the lake bed extends to four feet below sea level. When the surfaces of the lake and ocean are at equal levels, you can walk across the entire lake—it's only two to three feet deep. Rainfall and drainage from the lake's 50,000-acre watershed flood many acres of marsh in the winter and spring, attracting the well-known hordes of waterfowl.

Then summer evaporation pulls the lake level to 8 to 10 inches below sea level, drying the marshes and allowing food plants to germinate. Then the entire process begins again. Since the lake is below

Mattamuskeet's 400 acres of farmland, harvested on a staggered basis throughout the winter months, provide a continuing source of wildlife food. Deer, geese, swans, ducks, and clouds of blackbirds feed side by side in this field (opposite page) along Waupoppin Canal.

sea level at this time, control gates on the drainage canals are closed to prevent salty seawater from entering the lake; this would be disastrous to the fresh-water marsh plants. Dikes and pump stations around some of the marshes and farm areas allow precise water level control regardless of rainfall.

The lake's history is quite colorful. Tradition has it that it was named after the Algonquin Indian word meaning "dry dust," and most evidence now points to the lake being formed by a great fire which burned deep into the peat soils. The fire burned for 13 months according to Indian legend, and the resulting depression filled with water forming the lake. The area was little disturbed until the mid-1800's. At this time the first of several attempts to drain the lake was made, and failed. Then, in 1925, a philanthropic Dutchman named August Hecksher bought the entire like. He planned to drain it and farm the bed in the manner used in Holland; thus he called his outfit the New Holland Corporation.

Canals were dug to Pamlico Sound and a huge pump plant was built. Its coal-fired pumps drained the lake at a rate of about a million gallons per minute, and by 1930 some 9,000 acres of the lake bed were under cultivation. Bumper crops of soybeans, barley, oats, potatoes, and other crops were produced. Then things began to break down. Frequent pump failure, excessive rainfall, and agricultural pests plagued the operation. In 1933 the crops went unharvested, knee-deep in slime and water. Hecksher admitted defeat and the New Holland Corp. ceased to exist. Fish and wildlife populations, disturbed by the drainage attempt, began to return as the lake rose to normal levels.

December 18, 1934, marked a new beginning for Mattamuskeet. The Federal Government bought the lake and surrounding marsh and timber and assigned the area to the U. S. Biological Survey (later to become the U. S. Fish and Wildlife Service) as a national wildlife refuge. The Civilian Conservation Corps converted the defunct pump plant into a visitors' lodge; the 150-foot chimney became an observation tower open to sightseers. Waterfowl came in massive numbers to feed on dense stands of rushes, grasses, and other natural foods growing around the lake. Federal and state officials cooperated to open controlled hunts on the refuge, and Mattamuskeet gained national popularity and recognition.

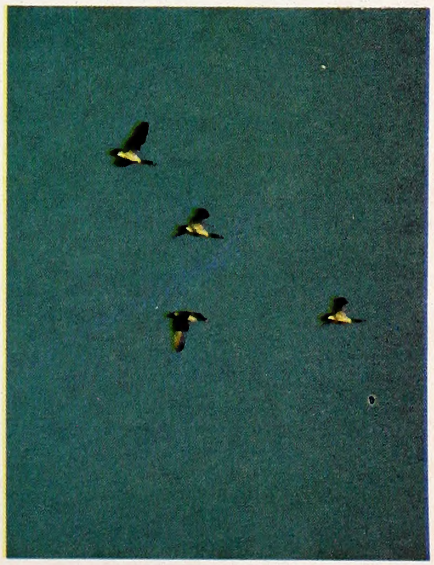
All good things must come to an end, or at least slow down. Waterfowl populations appeared infinite, until in 1960 they peaked at over 100,000 Canada geese, 200,000 ducks, and 4,000 whistling swans. Large numbers of marsh and water birds wintered on the refuge. Then a drastic decline in waterfowl numbers began to occur. By 1968 geese and ducks had dropped to one-fourth their original numbers. 1972 counts yielded a startling revelation—a peak population of only 15,000 Canadas and 43,000 ducks. By the end of the hunting season only 7,000 geese were left.

There were several reasons advanced for this decline. Mattamuskeet's marshes were deteriorating because of invasion by non-food species and poor water control. Changing land use practices in North Carolina also reduced the amount of food available to birds (only 30 percent of their feed comes from refuge marshes — the rest comes from harvested fields). After a devastating hurricane hit the coast in October, 1962, farmers began using short season corn. By the time fowl began arriving from the north, the waste corn had either sprouted or been eaten by local birds.

Farther north along the Chesapeake Bay essentially the reverse was happening, farmers were using longer season corn which made more feed available later in the season. Waterfowl would come to Mattamuskeet, get shot at for a couple of weeks, and decide they would rather be well-nourished and cold than be starved and warm. Banding studies indicate that over 50 percent of the birds began to drift back north by the second week of December.

Something had to be done. Against tremendous political and local pressure, the U. S. Fish and Wildlife Service closed the refuge to hunting for a period of five years beginning with the 1973-74 season. The lodge and observation tower were also shut down in the spring of 1974.

Prior to 1967 only two areas existed on the refuge where water levels could be controlled. The only ways of controlling undesirable plants in the natural marshes were by burning and plowing in the spring when water levels permitted. Only small acreages could be controlled in this manner, and brush and cattail were slowly taking over. In 1967 money was allocated to begin new projects which had



Many of Mattamuskeet's attractions can be seen without a lot of walking. At top, the old pumping station, later converted to a visitor's lodge and observation tower, was closed in 1974. Highway 94 (center) crosses the lake and provides a fine place to view flocks of waterfowl during the winter. Lead poisoning of waterfowl is a serious problem at Mattamuskeet. Here, a group of wildlife students examine a dying juvenile swan.

been planned earlier. Three marsh impoundments and five farm areas are now complete, and others are under construction. These projects improved management capabilities greatly.

These measures apparently have paid off. The peak populations in 1976-77 were improved—30,000 geese and 80,000 ducks. One of the biggest surprises has been the explosive increase in the number of whistling swans wintering on the refuge. This past winter the peak reached over 22,000 swans — or about one-fifth the entire continental population! In the late 1960's the lake bed itself was invaded by wild celery (*Vallisneria americana*), one of the best wildfowl foods there is. Although not managed for, the plant now covers 60-80 percent of the lake bottom and attracts several species of diving ducks which didn't frequent the lake before. Large numbers of ruddy ducks, canvasbacks, ringnecks, redheads, and scaup now winter at Mattamuskeet. If populations continue to improve, officials may meet in the summer of 1978 to consider — repeat, CONSIDER—reopening the refuge to hunting on a limited basis.

During the winter months Mattamuskeet offers the casual sightseer one of the most spectacular wildlife shows he can see anywhere. By the end of November, most species of waterfowl have arrived and rest in huge flocks within easy view of the causeway (N.C. Highway 94 which crosses the lake). Tourists can pull onto the shoulder of the road and see thousands of geese, swans, ducks, shorebirds, even mink and otter without leaving their cars. If one hikes along the roads and dikes behind refuge headquarters, he will see still more fowl along with various hawk species.

There are four to six bald eagles and one or two golden eagles which winter on the refuge; we saw three bald eagles at one time perching in cypress trees along the west shore. During the spring and summer months ospreys are quite common. By mid-summer there are usually 30 to 40 nesting pairs present.

Deer are common the year around. Their tracks can be found within 10 feet of refuge headquarters, and herds of ten to 20 animals can frequently be seen around the farmed areas. There are over 200 species of songbirds found on the refuge at various times of the year. A stop at headquarters will provide information on which areas of the refuge are accessible. Some areas are closed during winter months and dirt roads may be impassable after a rain. Pamphlets are also available which describe the refuge and tell which species of birds can be seen in which seasons. The period from early November to mid-March is the best time to visit Mattamuskeet. There is not enough

readily visible birdlife during the summer to interest many visitors. By the way, groups of 10 or more can get a guided tour if they call ahead and if time permits.

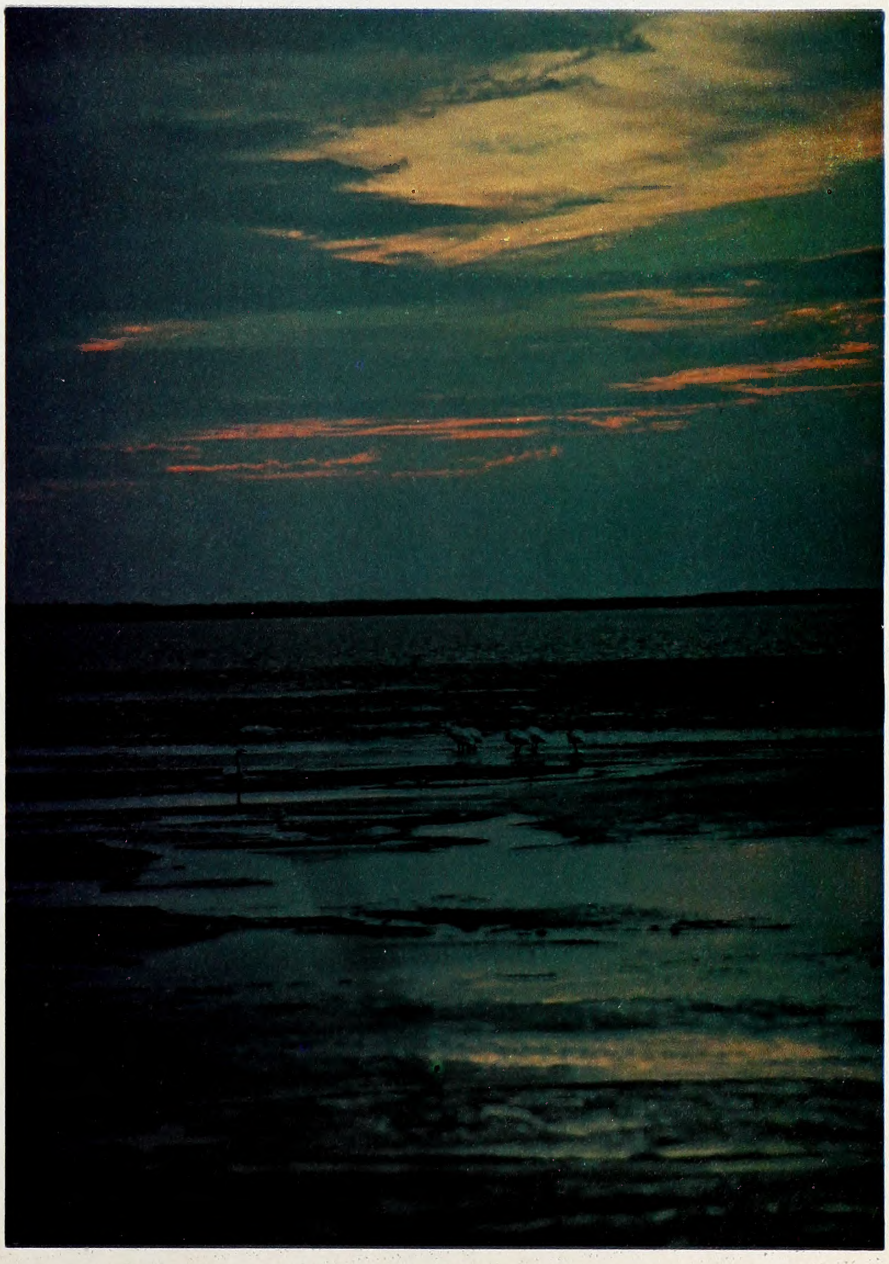
Although best known for its waterfowl, Mattamuskeet also offers the fisherman a chance to try his luck. Bass (including striped bass), bream, and other fish are found in the lake and canals. Herring dipping is permitted from March 1 - May 15 in designated areas. Copies of fishing regulations are available at headquarters. I have not personally tried the fishing, but from the number of people carrying poles and dipnets when I was there on March 21, there must be something to it.

There are several motels and small stores near the refuge, but restaurants are rather scarce during the closed hunting season. You may want to bring a picnic lunch if the weather's nice; there are many picturesque areas around the refuge. One warning — bring your own camera film. I found out the hard way that those small stores are very limited in their film supplies.

After Mr. Fulton's slide show, we broke for lunch and I began my futile hunt for camera film. That afternoon we went to the west end of the refuge; it was then that we spotted the three bald eagles. Later in the evening we went out to trap woodcock in the soybean fields bordering the refuge. This was in connection with a banding project to study the migratory habits of this secretive little bird. We caught them by spotlighting the birds on the ground and dropping a net attached to the end of a long pole over them; it's not as easy as it sounds and makes a story in itself. Many other educational projects and studies are also conducted on and around the refuge.

The next morning we got up early for a few more hours of bird-watching. That afternoon the wildlife class left for Pea Island National Wildlife Refuge and I wandered out along the canal one more time. As I headed back toward the car I wondered about the long trip north that the swans, geese, and ducks would be starting in a few short weeks. The calls of thousands of geese and swans in flight was, to me, a call of unequaled freedom, and I felt a pang of envy for them as the sun slipped below the trees.

Several species of game birds are studied in and around the Mattamuskeet area. This woodcock (above) has been fitted with a leg band which will help provide information about its migratory patterns.



CAMP FOR THE RAINBOW

As many Tarheel trout fishermen know, some of the best streams in the state are also the least accessible. It often takes a strenuous trek down steep trails in the morning and out again at dusk just to fish some of our finest waters. Thus many anglers miss the prime fishing hours since they're laboriously trying to get to or from the stream.

A backpacking-camping fisherman can, on the other hand, be comfortably camped on his favorite stream and take advantage of those peak fishing hours. The camping fisherman can also afford to fish more at his leisure; more thoroughly, since he's not preoccupied with an arduous climb out at day's end. Since many of our headwater streams are remote and seldom fished they offer great potential to the camping trouter. Odds are good that the camping fisherman will have the stream all to himself.

It's not necessary to invest a fortune in specialized, expensive camping equipment to camp-fish. Modern lightweight trail gear will, however, add to your enjoyment simply because it requires less effort to lug around. At minimum you'll need a pack, sleeping bag, some sort of shelter and food in addition to your regular trout fishing equipment. If you plan to camp-fish in early spring, be sure to take adequate clothing because the weather can be awfully unpredictable and can change for the worse quickly.

A good rule of thumb in deciding what clothing to take includes a check on past years' weather data for the area you plan to fish, paying particular attention to the temperature. Pack your gear with the assumption that on the nights you'll be out it will be at least that cold again.

If you plan to camp on forest service lands be sure to check local regulations for fire and camping permits. Most game land areas do not require such permits, but it's wise to check anyway. And don't forget your fishing license.

A camper fisherman has another edge over the conventional trouter. Since you'll probably be in rather inaccessible areas, the hand of man is less noticeable. Make sure you take care to leave the area as Nature intended it. A variety of Nature at her best awaits those willing to work for the privilege of observing. Camping and fishing in a pristine environment with spectacular views are reward enough. If you also happen to catch a few native rainbows, well that's icing on the cake.

by John Crew
Photos by the Author

A camping-fishing trip provides opportunities for forest treks amid cool ferns (upper left) or the discovery of nature's out-of-the-ordinary items such as this large burl (above). It's best to be prepared for showers, and a plastic tarp is lightweight yet effective protection (left). Shortcuts across rock-strewn streams are for the sure-footed only; be careful.

- Letters
- Comments
- This & That

BACK OF THE BOOK

Wrong Birds

I'm concerned about the practice of farmers placing poison in fields for blackbirds. I have heard that a common poison placed in fields is rat poison. Blackbirds are a destructive nuisance, and I do not object to poisoning blackbirds in order to protect crops. But the attempt to control blackbirds is destroying other valuable wildlife.

To give a prime example, a field near my home was sprinkled with poison by a farmer in order to protect his newly planted bean crop. The field is approximately two to three acres in size. I noticed dead birds lying in the road and woods next to the field and decided to make a bird count. I covered the entire field and bordering hedges and the edge of a surrounding stand of woods. I found 65 dead blackbirds, mostly grackles. But to my disappointment I also counted 65 dead mourning doves, 6 bluejays, 2 catbirds, 1 quail (hen), 1 cardinal (male) and 1 sparrow! As you can see, more beneficial birds perished than blackbirds. I'm sure that other birds ate the poison and managed to fly into the woods or other areas and died there. This poisoning could seriously affect the mourning dove population. I trust farmers will become aware of this problem, and abstain from using such poisons to ward off blackbirds.

Thank you.

Randy Bottoms
High Point

Birds and Cherries

Dear Sir,

At least as far back as the days of George Washington we have had the problem of our fine feathered friends, the birds, taking a portion if not all of our beautiful red fruit we call cherries. No doubt there have been many birds killed needlessly doing so. The possible solution I offer would not be practical or even possible for everyone, and you can take it for whatever it turns out to be worth to you.

Some years back, in order to make our pasture fence in a straight line we needed to include in the pasture six cherry trees. We decided that we might as well since we hadn't gotten any cherries from them because of the birds anyway. The first summer after fencing the grass was not tall enough for pasturing so the birds cleaned the trees of cherries. The next year however, beef cows were grazed in this pasture and there was not even one cherry taken by a bird. The next year this pasture was not needed so there went the cherries. We didn't notice the correlation. The next year cows . . . cherries. We began to notice and wonder; but we thought, just coincidence. The next three years we needed the pasture, so cows . . . cherries. The next year we didn't have to use that pasture so we decided to try no cows and see.

The result was,—yes you guessed it, no cherries. Ever since cows . . . cherries. Your explanation of this phenomenon is as good as mine. The cows would spend more time under the cherry trees than anywhere else because there was shade, a salt block, taller grass and they could fellowship with the ones in the next pasture better there.

Earl B. Johnson
Burlington

KNOW YOUR ENFORCEMENT OFFICER

Wayne L. Wicker

Wildlife Enforcement officer Wayne L. Wicker was born July 25, 1945 in Lee County and is the son of R. B. Wicker, Jr., (deceased) and Mrs. Wicker of Sanford, N. C. Officer Wicker graduated from Sanford Central High School in 1964 with honors in sports.

His military experience includes four years in the U. S. Navy where he received the Navy Commendation Medal with combat "V". Officer Wicker attended Wildlife Basic Recruit School in June of 1970 and was employed by the Wildlife Commission October 1, 1970, and was stationed in Roanoke Rapids. Wicker has attended all wildlife in-service schools and is presently attending Nash Technical Institute during off-duty hours.

Mr. Wicker is a member of the Southeastern Law Enforcement Association, and is a certified Hunter Safety Instructor and participates on the district's Water Safety Team. He is a member of the First Presbyterian Church of Sanford. Officer Wicker was transferred to his present station in Warren County on September 1, 1971.

ENFORCEMENT RECORD FOR MARCH, 1977

HUNTING AND FISHING	
Persons Checked	22,451
Total Prosecutions	636
Total Convictions	578
Total Fines Collected	$ 9,841.00
Total Costs Collected	$13,041.00
BOATING	
Boats Checked	5,627
Total Prosecutions	67
Total Convictions	56
Total Fines Collected	$ 185.00
Total Costs Collected	$ 1,388.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

• ENVIRONMENTAL from p. 19

will be invited to tell representatives of the State how they want these problems solved.

Participation in the 208 Program will require concerned citizens to commit a small amount of time. It will also require some of the patience of the fisherman while the State conducts careful studies to determine the cause of water quality problems. But the commitment of patience and time involved in guaranteeing clean water for North Carolina will be rewarded. It will be rewarded when, instead of telling your grandchildren "how it used to be," you can take them out on their first fishing trip.

Todd Llewellyn
Div. of Environmental Management

Enforcement Officer Doran T. Robbins was honored this spring by the Shikar-Safari Club International for outstanding contributions to wildlife conservation. Presenting the certificate is Dr. Joseph W. Lawson (right). A commemorate plate, also presented, is held by Assistant Chief S. R. Johnson, Jr.

• HAMMOCK BEACH from page 11

lost were never recorded, five ships are definitely known to have gone down near the island.

Bogue and Bear inlets, at the east and west ends of the islands, respectively, are also historically significant. In 1747, Onslow County came under siege by Spanish forces from St. Augustine, Florida. Subsequently, the Bear Inlet Fort was erected and manned by order of the Colonial Assembly to defend against future attacks. The fort, built on the Bear Inlet side in 1749, was used for only a short time and has since disappeared.

The next owner was John Starkey, who was the first representative for Onslow County in the Colonial Assembly and served there for 31 years. He was a champion of rights of the colonists against the Royal Governor.

Captain Daniel Heady, a whaler from Core Banks moved to Bare Banks in the early 1800's and set up a whaling station to process whales and, later, porpoises for their oil. The island, known then as Heady's Beach, remained in his family for four generations.

In the 20th century, the island became the property of its last private owner, the late Dr. William Sharpe. A New York neurosurgeon who liked to hunt and fish in North Carolina, Dr. Sharpe purchased "The Hammock" as a recreation area for his retirement. In 1950 he gave the island to the Hammock's Beach Corporation, a group of black educators, with the proviso that it be developed for public use within 15 years. It was then turned over to the Division of State Parks in 1961, becoming one of three parks in the system designated for use by black citizens. With the Civil Rights Act of 1964, Hammocks Beach State Park along with every other state park was opened to all the citizens of North Carolina.

Since regular passenger ferry service was established in 1973, 13,000-16,000 people a year have visited Hammocks Beach State Park.

For more information about Hammocks Beach State Park and other parks in the N. C. State Park System write: Division of Parks and Recreation, N. C. Department of Parks and Recreation, N. C. Department of Natural and Economic Resources, P. O. Box 27687, Raleigh, N. C. 27611.

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Twin Fawns

Photo by R. Eugene Hester

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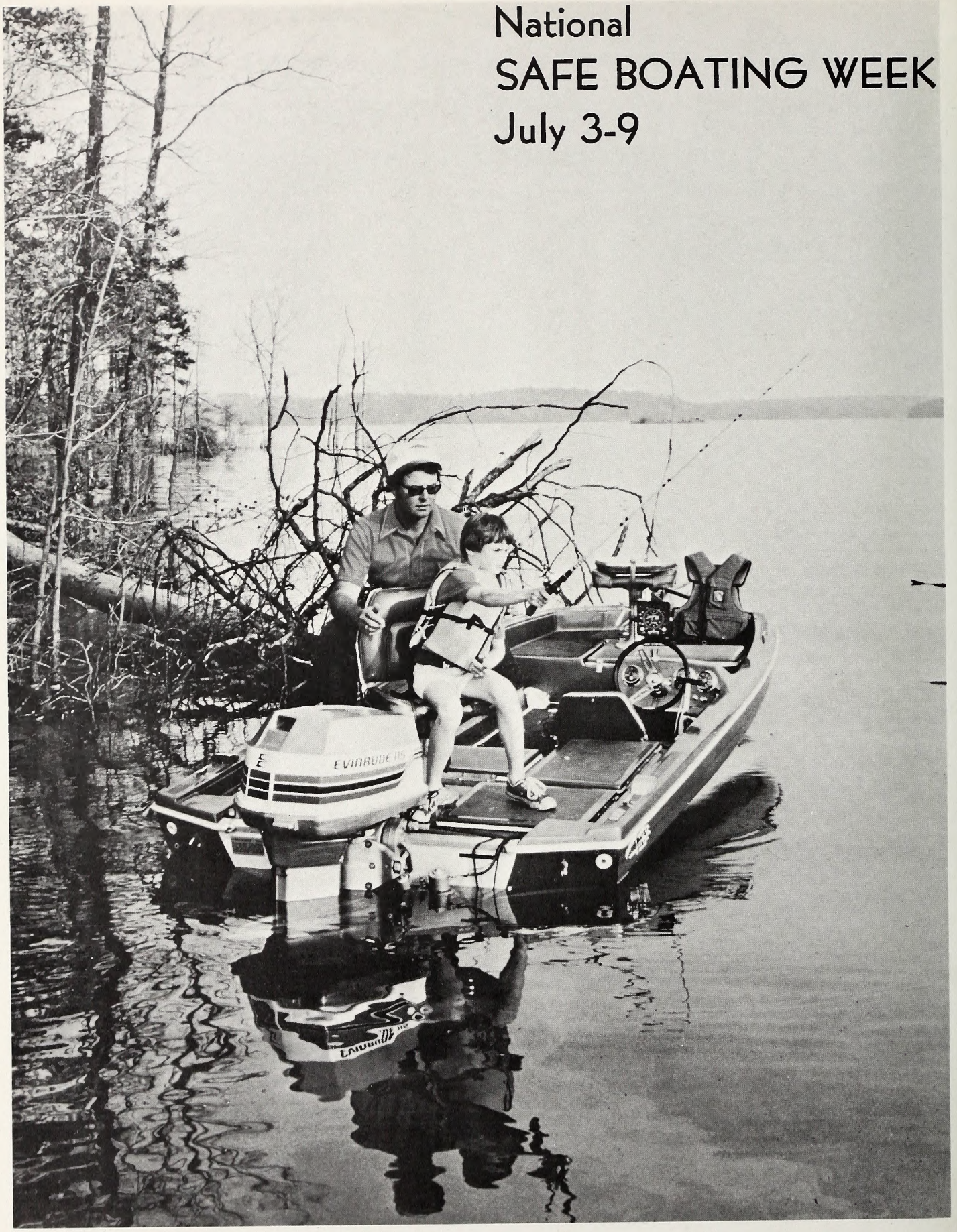
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EVINRUDE 115

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VOL. 41, NO. 7 JULY, 1977

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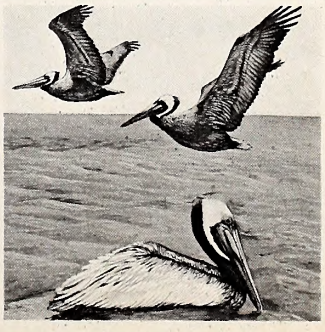


Brown pelicans just off Bald Head Island is the subject of this month's cover. This painting has been selected for the 1977 Endangered Species Print series and is available in a limited edition, numbered and signed by the artist, for a contribution of $25 or more. The Carolina Conservationist Program is described on page 26.

Wildlife Commission Begins Research Program on ENDANGERED SPECIES

THE Wildlife Commission has issued an invitation to biologists having expertise on various endangered species to submit study proposals aimed at determining the status and distribution of such species in North Carolina. Under terms of a federally funded cooperative program, the Commission will be developing information that will be helpful in preserving several species occurring in North Carolina that have been declared to be endangered by the U. S. Fish and Wildlife Service.

Fifteen species on the federal endangered species list occur or are known to have occurred at some time in the past in those portions of North Carolina under the jurisdiction of the Wildlife Commission. In addition, seven species of whales occur in North Carolina waters outside of the territorial jurisdiction of the Commission. The leatherback turtle and shortnose sturgeon migrate into and out of the Commission's area of jurisdiction.

Species on which study proposals are being invited are as follows:

Red-cockaded Woodpecker Of all the endangered species in the state, this one probably has the largest number of survivors. It is likely that in the years ahead, the Sandhills Game Land and the Fort Bragg Military Reservation will constitute the two major reservoirs in our state for this species. Viable populations probably will also persist on the Croatan National Forest, Camp Lejeune and Cherry Point. Initial studies will be directed toward inventorying the colonies on these areas as well as at other locations statewide. In addition, the Commission is undertaking habitat development work on the Sandhills Game Land.

American Alligator We may have as many alligators as red-cockaded woodpeckers since individual habitats may have fairly large numbers of relatively inconspicuous im-

RED-COCKADED WOODPECKER PHOTO BY MIKE GODFREY

U. S. FISH & WILDLIFE SERVICE

AMERICAN ALLIGATOR

by Frank Barick
Chief, Interagency Coordination Section

U. S. FISH & WILDLIFE SERVICE

BALD EAGLE

PEREGRINE FALCON

matures. There is, however, no documented inventory of occupied habitats. At least two studies are under consideration: 1) an indepth study of life history of the alligator in North Carolina and 2) a statewide inventory of occupied habitats.

Brown Pelican The northernmost breeding colony of this species is on a dredge spoil island near Ocracoke along our coast. The colony consists of about 200 birds and has remained fairly stable for some time. Anticipated studies will explore its life history and ecological relationships to identify limiting factors and to explore methods of pelican population expansion.

Peregrine Falcon There are (or at least *were*) two sub-species of this bird — the American and the Arctic. The American may be extinct, at least in the eastern part of the country. As recently as 20 years ago, there were still some occupied eyries (nesting areas) in the western part of our state but they have been unoccupied for some time. During fall migrations they are still being observed while passing along our Outer Banks. These birds need to be more closely monitored and we will probably be working with the Peregrine Falcon Recovery Team to establish new populations.

Bald Eagle At one time this bird was fairly common in the eastern part of the state but for the past several years only an occasional migrant has been seen. No nesting pairs have been observed for many years until a pair was reported near the state line south of Charlotte a few months ago. The purpose of the proposed study will be to consolidate old reports and to develop a coordinated reporting system for new sightings. Also, potential nesting areas will be identified with a view toward restocking if such should prove feasible in the years ahead.

Eastern Cougar In spite of the fact that this species has been considered to be extinct for several decades, increasing numbers of sightings have been reported in recent years. Most, but not all, reports have been from remote areas in the far eastern and western portions of the state. There is a need to not only check more thoroughly into each of these reports but to also devise means of verification.

Indiana and Gray Bats These two species of bats are more common in the states to the west. Both have been brought to the verge of extinction through excessive molestation in the caves used for roosting purposes. Studies will include a careful inspection of caves in western North Carolina likely to be used by this species and development of procedures designed to reduce molestation.

Florida Manatee As the name indicates, this species is more common in coastal waters south of North Carolina. Occasional migrants have been observed in the lower Cape Fear River. Due to its rarity and secretive nature, it may be necessary to include air search in inventory efforts. If there is any substantial usage of our coastal waters, we will have to determine preferred types of habitat and develop measures that will provide the necessary protection.

Some agencies and individuals have already indicated interest in participating in this research effort. Unfortunately, there are relatively few experts in endangered species research and field biologists trained in other areas will have to develop new research techniques to provide the Commission with information necessary to develop preservation procedures. Individuals and institutions having an interest in participating in this program should contact the Commission's Interagency Coordination Section in Raleigh.

Five other species on North Carolina's officially designated endangered list will not be included in this initial research effort. Three of these are birds, so rare as to not have been reported in North Carolina for many years — Kirtland's warbler, Bachman's warbler and the ivory-billed woodpecker. The first two of these were at one time seasonal migrants through the state and restoration efforts will have to be concentrated in breeding and wintering areas by other agencies in other states. The ivory-billed woodpecker requires extensive stands of old growth timber and it is doubtful that we will be able to find suitable habitat for it here. The leatherback turtle nests on our Outer Banks and the shortnose sturgeon may still be in our coastal waters. Due to unclear delineation of jurisdiction between the U. S. Department of Commerce and the U. S. Department of the Interior, funding for work on these last two species has not yet been made available.

Unscrambling Rumors:

The Status of the Panther in North Carolina

by David S. Lee
N. C. State Museum of Natural History

SNYDER County, Pennsylvania, which lies north of Harrisburg, was the setting for an extraordinary event that took place in 1760. In that year "Black Jack" Schwartz organized 200 frontiersmen into the first documented circle hunt in America. Surrounding a circular area of approximately 700 square miles, they started walking toward its center, herding game in front of them and shooting every animal they saw. As the slaughter progressed, dead and dying animals were scattered everywhere. Some escaped, and uncounted numbers of wounded animals probably found their way past the line of beaters, but the hunt was, by their standards, a great success. The final tallies included 114 bobcats, 111 buffaloes, 112 foxes, 109 wolves, 98 deer, 41 panthers, 18 bears, 3 fishers, 3 beavers, 2 elk, and 500 unidentified smaller animals.

Only the choicest hides and the buffalo tongues were taken, and a pile of carcasses "as tall as the tallest trees" was stacked with pine and burned. The resulting stench was so great that settlers as far away as three miles were forced to vacate their cabins.

The purpose of this hunt was not to obtain provisions but to force the Indians out of the area by eliminating the game on which they were dependent. The Indians were understandably enraged by this vicious destruction of their only means of livelihood, and vengeance became paramount in the minds and actions of every Indian in the territory.

As banners of their hunting prowess, many of the participants in the hunt appeared in full suits of panther skin. This gave the Indians an obvious focus for retaliation, and the fashion was short-lived. Realizing that "Black Jack" had instigated the hunt, the Indians took special revenge on him — his scalping and mutilation are probably our earliest examples of environmental retribution.

Few Documented Records

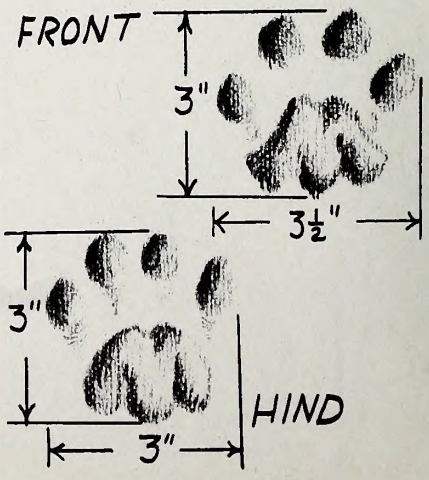
This account is not cited because of its contrast to present day environmental ethics, but because it is one of the few documented records of game abundance in colonial times. Circle hunting continued locally for the next 90 years, and was discontinued only when it became unprofitable. The tallies reported from these early hunts may represent our only records of original game densities in eastern North America.

The panther tallies are particularly interesting. Assuming the figures are accurate, the population density was somewhere around one individual per 17 square miles. A home range of this size at first seems small for a large, solitary predator like the panther. Calculating the densities for other species in the Schwartz hunt, however, produces figures consistent with data from more refined sampling, so the panther density is probably correct.

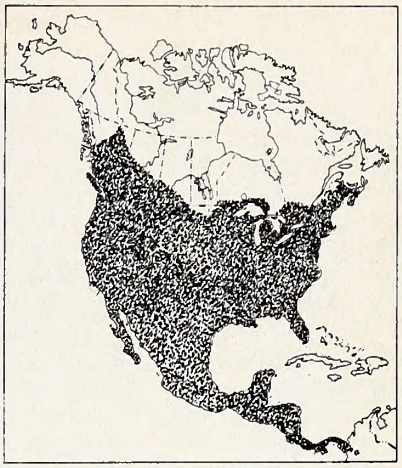
Few reliable studies of home range size for panthers are available, and of course there have been no such studies of these cats in eastern deciduous habitats. A recent study of Idaho, however, has shown that even in extensive open landscape, where prey is presumably less dense, home range is much more limited than generally believed. Researchers calculated that male panthers had a home range of from 15 to 30 square miles, while females averaged from 5 to 25 square miles, and many of their ranges overlapped. These figures are not too different from that produced by Black Jack's hunt.

Although there are few early records of panthers in North Carolina, written accounts from other Atlantic coast states indicate that these cats were relatively abundant and lived in a variety of habitats. In the past the distribution of panthers in North Carolina was certainly statewide. This can be documented indirectly by the bounty records that we have compiled from county records of the 1700 and 1800's, and by the 37 places named for the panther which are scattered throughout the state.

Many common names are given to *Felis concolor* in various parts of its range, but puma, catamount, mountain lion, panther, and cougar are the most familiar. In the eastern United States it was always referred to as the panther. This is evidenced by use of the word panther in place names, and the absence of the cat's other names on maps east of the Mississippi River. I now suspect that my use of the name panther on posters soliciting reports of this cat in North Carolina



The North Carolina State Museum of Natural History has been gathering information on the status of the panther in North Carolina. This is a continuing study that started in 1975. Much of the information is based on sight reports, which presents an obvious dilemma of reliability. The purpose of this report is to explain and summarize the preliminary results of this study.



Shown above is the historic range of the panther (Felis concolor) in North America. This species was also found throughout much of South America. Below is the present documented range of the panther.

may have caused confusion, since this name is shared with the black phase of the African and Asiatic leopard. This confusion may have contributed in part to the number of reports of "black panthers" which we process at the museum.

There are no authentic records (specimens or photographs) of melanistic panthers from North America and only a few from South America. Some of the literature states otherwise, but the scientific community seems to be in complete agreement on this point. This has removed some credibility from sight reports that are convincing in all other respects. Many of these sightings of black cats can be accounted for by the poor light conditions which prevailed when the observations were made. Nevertheless, we have several accounts of "black panthers" observed by reputable and/or multiple witnesses at close range and in good light. To mollify those who know they have seen a black panther, it is only fair to mention that even large series of panther skins collected from one locality exhibit marked variation in coloration. It should also be pointed out that to my knowledge, there is only one skin and one photograph of the eastern panther still available for examination. All other specimens of the eastern sub-species are skulls or skull fragments. For the Florida race, however, there are a number of existing skins and photographs, none of which is black.

Many Subspecies

There are 30 recognized subspecies of *Felis concolor,* fifteen in North America and fifteen in South America. Two of the North American races occur in the east, and either or both could be in North Carolina. The northern limits of the Florida race, *Felis concolor coryi,* were not documented prior to its extensive decimation. It is reasonable, however, to suspect that this animal occurred, or perhaps still occurs, in our southern Coastal Plain counties.

At the time of this writing we have accumulated nearly 300 reports of panthers in North Carolina. Nearly 60 percent are recent re-

A sketch of the front and hind paw tracks of the panther is shown on facing page. Several reports of bear tracks (pointed to at far left) and large dog tracks (measured below) have come in mistakenly as panther tracks. Skull size and conformity of bobcat (left, below) and panther are compared in these museum specimens.

sponses to our survey, and another 15 percent represent recent records accumulated by Dr. Frederick S. Barkalow Jr., of N. C. State University and by the N. C. Wildlife Resources Commission. The remaining 25 percent are from old court records, newspaper accounts, reports from museum files, and literature records. It is interesting to note the almost complete lack of hard supporting evidence. Skins, skulls, and photographs are completely lacking. Even though good eyewitness accounts abound, casts or photographs of tracks, descriptions of typical kills, recordings of screams, and hair samples, are virtually unavailable.

At present the N. C. State Museum has several questionable (at least not typical) casts of tracks, one set of scats, which is probably from a panther, descriptions and documentation of two atypical kills, and four hair samples. The hair samples may be our best evidence, but they have not all yet been carefully analyzed. Two additional hair samples examined by Dr. Barkalow several years ago were probably from a panther, but additional staining studies would be helpful in confirming the conclusions from his electron microscope work.

The problems in pinning down this elusive cat are not unique to North Carolina. Recent panther reports also are available for virtually every other eastern state, although they are only known officially to occur in New Brunswick and Florida (see maps). A particularly impressive number of sight reports exist for Alabama, South Carolina, Tennessee, and Virginia. A particularly impressive number of sight reports exist for Alabama. Yet, even in areas where there are confirmed records, such as Florida, there is much difference of opinion concerning determination of population size. Current estimates for Florida range from a conservative 30 to an optimistic 300 individuals.

In order to rate the relative reliability of reports, Florida researchers have devised the following four-point scale:

I. Report based on an actual specimen (entire animal or recognizable element), captured individual, good photograph of an animal showing important features, or clearly identifiable sign, such as scats or tracks, accompanied by adequate supporting data. To qualify for this category, scats must have been collected, measured, and photographed, or photographed with a scale allowing accurate determination of size. Records based on tracks must be supported by casts or clear photographs either containing a suitable scale for determination of size or accompanied by actual measurements.

II. Report of a sighting under optimum conditions by an observer of known reliability.

III. Report of a sighting under optimum conditions by an observer of unknown qualifications, accompanied by a convincing description of the animal or other details of the sighting.

IV. Report by an unknown observer of a sighting under apparently good conditions, but not accompanied by convincing supporting data, or a report by an observer of known reliability of a questionable sighting due to poor conditions or other factors.

Using this same ranking procedure, our 285 reports break down approximately as follows: Category I: 2 percent; Category II: 20 percent; Category III: 45 percent; and Category IV: 33 percent. Most of our reports in categories I and II are from the extreme western part of the state. A small but reliable number of reports came from the Uwharrie National Forest in the Piedmont Plateau, and a fair number of widely scattered reports originated from the lower Coastal Plain. Many of these reports, made by independent observers, are clustered in both time and location.

Panther-Deer Relationship

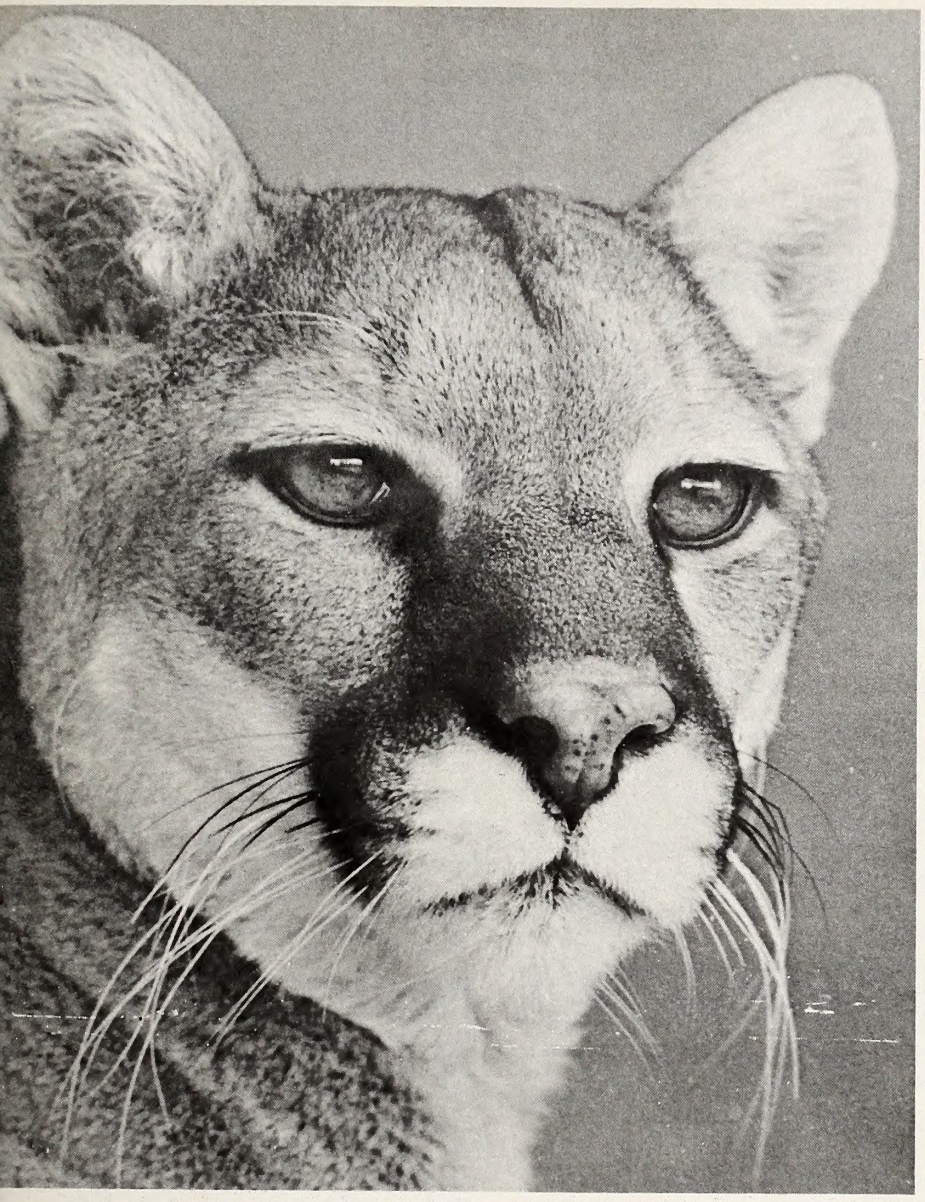
Current forestry practices and game management may be important factors for the survival of the panther. White-tailed deer, an important food source for these cats, were greatly depleted by the turn of the century. Deer populations were limited to a few remote mountain and coastal localities. Interestingly, most of the panther reports from this period were from areas with extant deer populations. As deer management in the southeast allowed the herds to expand, panther reports became more numerous and more widely distributed. It should also be mentioned that in many of the areas where panthers are now reported the human population is less dense than it was at the turn of the century, and the percent of forested land has, in many cases, increased.

Many people and organizations throughout the state are interested in the possible survival of the panther in North Carolina. Our efforts to investigate its occurrence are closely coordinated with those of the U. S. Forest Service and the North Carolina Wildlife Resources Commission. Other independent investigations are actively being conducted by personnel of the Great Smoky Mountain National Park and the Blue Ridge Parkway, as well as by many private citizens. If panthers occur in this state, it should be only a matter of time until their presence is verified.

At this point a photograph of a panther or the carcass of a road kill would serve as positive proof. The hunting, collection, or harassment of a panther cannot be considered or condoned, since they are protected under the provisions of the Endangered Species Act of 1973. An actual specimen is not necessary, however, to show that this animal occurs in North Carolina. Clear casts or photographs of tracks, with accompanying measurements of the stride and other details, scats, hair samples, photographs and descriptions of kills, and possibly recordings of screams or other vocalizations, would provide us with the hard evidence needed. It is hoped that people reporting contact with panthers will understand the obvious difficulties of judging reliability, and that they will attempt to obtain evidence substantiating their sightings.

It should be pointed out that we do not profess to be experts on panthers. We are a regional monitoring center to record, process, and file all reports coming to us. We make efforts to check promising leads, or, more often, to alert others who are able to investigate likely sites of occurrence in their areas.

Our information will be useful in attempting to plan future programs concerning studies of the panther in the east. The U. S. Forest Service, in cooperation with the U. S. Fish and Wildlife Service, and State Museum, is presently planning to bring panther specialists from the



Until an authentic photo of a panther taken in North Carolina comes in, or a genuine carcass shows up, scientists are unwilling to confirm the cat's presence here. Perhaps the question will go unresolved for many years.

west to sites in North Carolina where we have clusters of records. Combined efforts at such sites should enable us to focus our field work toward locating tracks and other signs, and, hopefully, to resolve the current undetermined status of the panther in N. C.

In brief, the phase of this study designed to unscramble rumors is coming to an end. We are seeing definite patterns in the reports that suggest the possibility of small, permanent populations in several areas of the state, and our attention will now turn to field efforts in these areas.

Does It or Doesn't It?

It would be unfair to the readers of *Wildlife in North Carolina* if I did not express my opinion concerning the current status of the panther in the state, although it certainly must be considered tentatively. Objectively, in light of the almost complete lack of hard data, I am not convinced that this cat occurs here. Although the number and quality of reports in many cases are quite impressive, solid evidence still eludes us. Subjectively, however, I suspect they are with us. We have now accumulated enough information that the matter is no longer one of idle curiosity. As previously mentioned, personnel of the U. S. Forest Service, Fish and Wildlife Service, and various state and federal parks, along with numerous private citizens, all are engaged in programs that should provide us with additional insight concerning panthers in North Carolina.

My overall stance on the question lies somewhere between a neutral position or "wait-and-see" attitude, and cautious optimism. Otherwise it would be difficult to stay in pursuit of information on these elusive animals. To those persons who completely deny the possibility of the panther's recent occurrence in North Carolina I would make the following points:

1. Individuals apparently require a smaller home range in our habitats than was originally thought.
2. Panthers are elusive and solitary animals, and even in parts of the country where they are definitely known to occur, wildlife biologists may spend a lifetime in the field without encountering one.
3. Numerous independent, reliable sight reports cluster, both in time and geographic location.
4. The species is behaviorally adaptable, and has been reported in virtually every habitat in the Americas, from sea level to 13,000 feet in South American mountain ranges.
5. The panther's primary prey, deer, have increased greatly in abundance as a result of wildlife management and regulations, and certain current land use practices.

There is another interesting facet of our investigations which could have ramifications as far as protection, and thus recovery, is concerned. A larger number of people who reported sightings were reluctant to do so for fear that their reports might result in some harm to the animals which they observed. This in itself is an encouraging recognition of the ecological and aesthetic value of larger predators by the general public.

In the eastern United States the panther is an Endangered Species, and can probably never again be common anywhere in this part of the country. If it still occurs in North Carolina, it is certainly not abundant. But, even its suspected presence adds a new and exciting dimension to our outdoor experience. Discussions around an autumn campfire on Panther Knob in Macon County would convince anyone that *Felis concolor* is, at least in spirit, still with us. ◆

THE HIDDEN STATE PARKS

by Marcia Constantino

THIRD IN A SERIES

NATURAL sand beaches and evergreens cloaked with Spanish moss. A southern swamp forest dominated by massive gums and cypresses. Good bass fishing around a quiet mountain lake.

These are some of the attractions of the "hidden" state parks, the newest parks in the North Carolina State Park System. They are little known outside their areas because they are either totally undeveloped or have a minimum of interim development for public use.

Seven parks welcome visitors to share a rich outdoor experience through family wilderness camping, hiking, fishing, river swimming, canoeing and rafting, and nature study. They are Crowder's Mountain State Park west of Gastonia; Eno River State Park northwest of Durham; Raven Rock State Park between Sanford and Lillington; Medoc Mountain State Park south of Roanoke Rapids; Goose Creek State Park east of Washington; Merchant's Millpond State Park northeast of Gatesville; and Dismal Swamp State Park north of Elizabeth City. Theodore Roosevelt Natural Area has recently opened for hiking and nature study.

SOUTH MOUNTAINS

Three parks and three natural areas have not yet been developed and are being physically maintained by park personnel from established state parks nearby. These are South Mountains State Park south of Morganton; Lake Waccamaw State Park east of Whiteville; Jockey's Ridge State Park at Nags Head; Masonboro Island Natural Area near Carolina Beach; and Hemlock Bluffs and Mitchell's Mill Natural Areas in Wake County.

Master plans for development of all areas in the State Park System are being prepared by the Master Planning Unit of the Division of Parks and Recreation. Until plans for new park areas can be implemented, they will remain undeveloped or operate with interim facilities.

INTERIM DEVELOPMENT PARKS

Crowder's Mountain

Crowder's Mountain State Park is located in the King's Mountain Range, site of a Major Revolutionary War battle. Development of the park master plan is dependent upon acquisition of King's Pinnacle and Crowder's Mountain, which are not yet in state ownership. The 1,291 acres owned by the State lie in a saddle between the two peaks.

The Crowder's Mountain master plan calls for low density recreational development providing for hike-in camping, boating, canoeing, picnicking, a trail system, and an environmental education program.

Recently installed interim use facilities include a picnic area, hiking and bridle trails, small wilderness camping area, and a lake just for fishing. Two hiking trails beginning at the park office lead to King's Pinnacle and Crowder's Mountain. The Fern Trail, a half-mile nature study trail, features several species of ferns and mountain-type vegetation such as blueberries. Around 90 species of birds have been identified in the area including over 20 species of warblers, seasonally.

Families and groups using wilderness campsites must backpack provisions including water into the campground 1½ miles from the park office. There are 10 family and 6 group sites in separate areas. Pit privies and rock fireplaces are the only facilities currently available for campers. The nine-acre lake provides good fishing for bass and bream. At the present time, boating and swimming are not permitted in the lake.

Crowder's Mountain State Park, six miles west of Gastonia, is open daily from 8:00 a.m. until sunset. Visitors can reach the park by traveling US 29-74 and SR 1125.

Raven Rock

A massive rock outcrop 152 feet high jutting out at a 45° angle over the Cape Fear River is the outstanding geological feature at Raven Rock State Park. The rock, composed of quartzite and slate, extends for more than a mile along the south side of the river. The park is on the fall line of the Piedmont and Coastal regions. The term "fall line" identifies that area which separates the hard resistant rocks of the Piedmont from the sediments and softer rocks of the Coastal Plain.

Master plan development is geared toward interpretation of the park's unusual environment. An interpretive center, natural history slide-lecture programs, and horseback riding trails are some of the new facilties recommended for Raven Rock State Park.

Recreational activities currently popular at the 2,723-acre park include picnicking, nature study, canoeing, fishing, primitive camping, and hiking. The three wilderness camping areas are designated for families, canoeists, and youth groups. They are more than two miles from the park office, and no drinking water is presently available anywhere in the park. Campers must pack in all their gear including water. The family and canoe camping areas have five sites each. The group camping area can accommodate up to 200 people.

Group leaders are advised to make advance arrangements with the park superintendent.

Thirteen miles of hiking trails give daytime visitors an opportunity to see much of the park. The trails lead to Raven Rock itself, rock outcrops along the Cape Fear, birdwatching sites, and to the mouth of Campbell's Creek, one of the park's best fishing spots. River and creek fishing are excellent for catfish, largemouth bass, and a variety of sunfish. The vegetation at the park is upper Piedmont with mountain laurel and rhododendron found in cool, well-drained ravines near small streams and on the face of the bluffs. Yucca and yellow jasmine are the major Coastal Plain species.

Mammals, birds, and reptiles in the park are representative of Piedmont woodlands. Nesting sites of wild turkey, a relatively rare species, have been located on the rock outcroppings and ridge tops along the river. An abundance of salamanders, thought to be the largest population east of the North Carolina mountains, exist in the area of the park. Major species are the dusky salamander, the two-lined salamander, and the slimy salamander.

Raven Rock State Park is open daily during the summer from 8:00 a.m. until 9:00 p.m. Eight miles east of Sanford, it can be reached via US 421 and SR 1250.

Eno River

Eno River State Park covers some 1,568 acres on both sides of the river for 15-20 miles. State ownership of lands along the river is not continuous, and agreement of further land acquisition has not yet been worked out between property owners and the State. Master planning is incomplete at this time, but the emphasis is on a very wilderness oriented park. Any facilities developed would be spread out and limited so that no one area would be damaged by overuse.

Nature hikes along existing trails are the major interim use activity at the park. Park rangers direct visitors to five non-connecting individual trails which require one to two hours to walk. Eno River State Park is on the fall line of the Piedmont and Coastal areas. Mountain laurel and rhododendron are just two of the Mountain-Piedmont plants found at Eno. Yellow lady-slipper, a relatively uncommon wildflower, has been identified here. River species such as beaver, river otter, muskrat, and mink are also park inhabitants. Summer naturalists are conducting environmental education programs and scheduled nature walks.

Few creature comforts are offered at the park's wilderness day-use area across the river. Access to this area is by boat. Picnicking is permitted, but there are no tables. The family camping area has five wilderness campsites and a pit privy. There is no drinking water anywhere in the park, but a hand operated pump is to be installed this summer.

Canoeing and rafting are popular in winter when the river is high. River users can call the park office in advance for a depth reading and directions on canoe access to the river.

Fishing is excellent in the Eno for red-eye (Roanoke) bass, catfish, chain pickerel (jack), largemouth bass, crappie, perch and bream.

Now under construction is the Eno River State Park Cole Mill Access. Designed to provide easy access to the river for canoeists and hikers, the area will have a 15-20 car parking lot, 8 picnic tables, and eventually a privy.

Eno River State Park is open daily during the summer from 8:00 a.m. until 9:00 p.m. It can be reached via I-85 and Cole Mill Road north of Durham.

Medoc Mountain

Medoc Mountain is not really a mountain but a long north-south trending ridge 300 feet above sea level. This park, like Raven Rock and Eno, is also on the fall line of the Piedmont and Coastal Plain. Mountain laurel grows in abundance on the sides of Medoc Mountain, and large numbers of the showy lady-slipper carpet the area in spring.

The master plan details facilities for picnicking, swimming, canoeing, horseback riding, and family and group wilderness camping.

Presently, picnicking, hiking, and fishing are the only activities available to visitors. The park has no drinking water or sanitary facilities. An interpretive trail is being laid out this summer to acquaint visitors with the plant life and history of the park. Angling in the mountain-like Little Fishing Creek is very good for bream, largemouth bass, chain pickerel, redbreast sunfish, and Roanoke bass.

Medoc Mountain State Park, 15 miles southwest of Roanoke Rapids, is open seven days a week, and the park office is open weekdays from 8:00 a.m. until 5:00 p.m. Access is by NC 48, SR 1002, and SR 1347.

Merchant's Millpond

A southern swamp forest dominated by massive gums and cypresses lends a mysterious quality to Merchant's Millpond State Park. A master plan for the 1,995-acre park has not been prepared, but interim facilities have been developed for public use. Camping, boating and canoeing, and fishing are the current popular activities. There are 18 campsites in three separate areas: six rough camping spaces accessible by road; six canoe campsites on the banks of the pond; and six wilderness hike-in sites. The park has no drinking water supply, so visitors must bring in their own. A parking lot and ramp are being installed this summer. Fishing is good for largemouth bass, bream, and chain pickerel.

The Youth Conservation Corps will assist park personnel this summer in constructing interim facilities including six miles of hiking trails, short interpretive trails, and picnic tables at the rough campsites and near the millpond.

Wildlife in and around the pond is varied and colorful. Wood ducks nest there in the spring and in summer the chrome yellow prothonotary warbler makes its appearance. The pond attracts whistling swans and other species of migratory waterfowl in winter. Osprey can be seen during the spring and fall. The red-cockaded woodpecker, an endangered species that is making a comeback in certain areas of the state, has been identified at the park. Beaver, muskrat, and river otters inhabit the pond and creek. A diversity of aquatic plants are represented by water lily, swamp rose, and wax myrtle.

Merchant's Millpond is northeast of Gatesville on SR 1403. The park operates seven days a week, and the office is open from 8:00 a.m. until 5:00 p.m. weekdays.

Dismal Swamp

Development at Dismal Swamp State Park is keyed to protecting one of the few remaining large areas of wet wilderness in the Eastern United States. The park, cover-

ing 14,344 acres, adjoins the Dismal Swamp National Wildlife Refuge in Virginia. The master plan calls for establishment of an interpretive program that will benefit the visiting public. Hiking trails would be developed from existing logging trails. Short self-guiding trails emanating from the major trails would allow visitors to become familiar with the unique plant and animal life of the region and to view the historic Dismal Swamp canal. Wilderness camping will eventually be offered as part of the overall interpretive program.

At the present time there are no facilities and no drinking water. The Youth Conservation Corps working at Merchant's Millpond will help develop interim use facilities at Dismal Swamp State Park this summer. A picnic area, family wilderness campsites, and an interpretive trail will be ready by fall.

The Dismal Swamp State Park, 16 miles north of Elizabeth City, can be reached by US 17 and 158.

Goose Creek

Goose Creek State Park, on 1,209 acres along the Pamlico River, is rich in natural beauty. Here one will find huge live oaks and towering evergreens hanging thick with Spanish moss.

The master plan is directed toward developing public recreation in keeping with the wilderness condition of the park. A nature interpretive center, family tent camping area, family wilderness camping area, boating activities area, and swimming beach are some of the facilities to be implemented in the future.

A wide variety of activities are offered under the park's current interim use status: picnicking, family wilderness camping, hiking, swimming, boating, and fishing. There are 12 tables and fire pits in the small picnic area; 10 tent sites in the family wilderness camping area. Drinking water is not yet available in the park, but pit privies are located in the camping, picnic, and boat ramp areas.

The Goose Creek Trail, a 2.6 mile hiking and nature study trail, runs from the picnic area to Goose Creek. Two raised boardwalks on the trail lead visitors through a cypress swamp and a wooded area. The shorter Live Oak Trail, less than a mile long, is designed primarily for nature study.

The river swimming area with natural sand beaches is protected by lifeguards on weekends. Visitors swim at their own risk at other times. There is no bathhouse for swimmers. A boat ramp on Goose Creek and a parking lot for 70 cars and trailers provides access to the river for boaters and canoeists. Goose Creek State Park offers both fresh and salt water fishing. Angling in Goose Creek for bass and panfish is excellent. Croaker, bluefish, flounder, and other salt-water fish are plentiful in the Pamlico River.

Park gates are open seven days a week. The park office is open from 8:00 a.m. until 5:00 p.m. weekdays. Goose Creek State Park is 8 miles east of Washington and can be reached via US 264 and SR 1334.

Theodore Roosevelt Natural Area

The Theodore Roosevelt Natural Area was a gift from the family of the nation's 26th President. The natural area represents the coastal plain brackish marsh and maritime forest in its pristine form.

The Hoffman Nature Trail, a self-guiding boardwalk nature trail, acquaints visitors with the abundant wildlife and unique plant life of this special environment. The Marine Resources Center-Bogue Banks located within the natural area interprets the coastal ecosystem through live exhibits and multimedia programs.

Theodore Roosevelt Natural Area is open daily from 9:00 a.m. until 5:00 p.m.; 1:00 p.m. - 5:00 p.m., Sundays. It is seven miles west of Atlantic Beach off US 70.

MASTER PLANNING

Over 35 parks, recreation areas, and natural areas cover some 76,000 acres, and every one will have a master plan. Master plans are guides for short and long term development and management of park resources. Planning is aimed toward achieving a balance between recreational and interpretive elements. The Division of Parks and Recreation is striving to provide recreational opportunities for the park-visiting public while maintaining the integrity of the park environment by protecting its natural and scenic values.

About four months time is required to develop one master plan. The planning unit is divided into teams which are assigned particular park areas. Newly acquired parks with no facilities are granted higher priority for master planning. Operating parks with a wide range of facilities receive lower priority rankings. Public interest and popular use of an area also affect the overall planning schedule. So far, 14 master plans on parks, natural areas, state lakes, one recreation area and one scenic river have been prepared.

Before developing a site plan, the team gathers information on regional location, population density, highway access to the area, history, adjacent land use, and existing site conditions. On-site investigations cover natural features and conditions—geology, climate, soils, elevation, surface and ground water, topography and slope, vegetation, and wildlife. From all data gathered, a site analysis is prepared and then mapped by the planners.

The results of the team's research efforts are presented at a public meeting where citizens are requested to contribute ideas and opinions. What people want plus the needs of the region are then combined with the mapped data to form a basic development plan with alternatives. At a second public meeting citizens are again invited to comment on the alternatives. Citizen suggestions are evaluated and incorporated into a final master plan which is reviewed and approved by Parks Division staff and then published.

The master plan, serving as a guide for orderly development recommends implementation by phases or as funds become available; acquisition of additional lands to complete development; increased staffing requirements as construction progresses. Because construction of park facilities is dependent upon funding availability, there is often a time lag between completion of the plan and actual development at the park.

As master plans are completed, the planning unit will become involved in supervision of on-site development of the plans. Planners will also monitor public use of park facilities after implementation to determine that both public use and protection of park features are being served by the plan.

Directions to and mailing addresses for the "hidden" state parks can be obtained by writing N. C. Division of Parks and Recreation, Department of Natural and Economic Resources, P. O. Box 27687, Raleigh, N. C. 27611.

A Day With the Pelicans

Text and Photos
by Curtis Wooten

A pair of common terns rose simultaneously from a mud flat as we approached the island. They climbed in unison to a height of 30 or 40 feet, arched their wings and soared gracefully for several seconds in their ritualistic courtship flight. It was mid-April and shore, marsh and sea birds were putting on their finest show in their efforts to win a mate. Two brown pelicans—the reason for our presence on the island—rose laboriously from a sand spit, circled the island, and landed with a gentle splash on the quiet waters a hundred yards away. Another hundred or so were gathered on and around the dome of the low sand-shell island. Their courtship had obviously taken place several weeks earlier, for a quarter of them were perched atop 18-inch high nests of sticks, mud and grasses. They appeared unconcerned about our presence on the island—as long as we kept our distance.

Ted Dossett and I were visiting the island, located in Pamlico Sound a few miles from Ocracoke, to photograph and film the nesting brown pelicans. They are one of 15 wildlife species native to North Carolina which are on the State and Federal endangered species list.

The island we were visiting and another less than a mile away, represent the northernmost nesting grounds for the brown pelican along the Atlantic Coast. They are also the only known brown pelican nesting sites in North Carolina.

Most North Carolinians are familiar with brown pelicans. Though not numerous, these big birds can be seen during all seasons along the North Carolina coast. They often travel in groups of three or four, and are a delight to watch as they skim effortlessly over the breakers and sail the troughs between them—their slow, measured wingbeats with military-like precision.

They often captivate appreciative audiences with head-first dives from considerable heights in attempts to catch menhaden, their primary food fish, or possibly a pin fish or mullet. Their twisting, turning vertical plunges appear a bit uncoordinated to the casual observer, but it's a highly developed technique which often yields a tasty morsel for the effort.

North Carolina's only nesting colony was apparently first discovered and reported in 1929 by William L. Birsch, a Federal conservation agent. He reported finding 14 pairs of pelicans nesting on Royal Shoal, a low island located about 10 miles northwest of Ocracoke Inlet in Pamlico Sound. After the

1929 discovery, no other records of their nesting occur until 1948 when 14 were reported nesting on Shell Island, a small sand-shell island in Pamlico Sound between Ocracoke and Portsmouth islands. Royal Shoal apparently eroded away in the intervening years and the pelicans shifted to the new site a few miles away. It is unknown if they nested in North Carolina during those intervening years, but it is reasonable to assume that they did, and were simply not found by anyone interested in recording the observation.

Recorded observations are spotty after the late 1940's. In July and August of 1948, 200 to 225 adults were observed in the Shell Island area; and in August of 1957, 35 nests and 162 adults were noted on the island; 100 nests and 500 adults were reported in 1958.

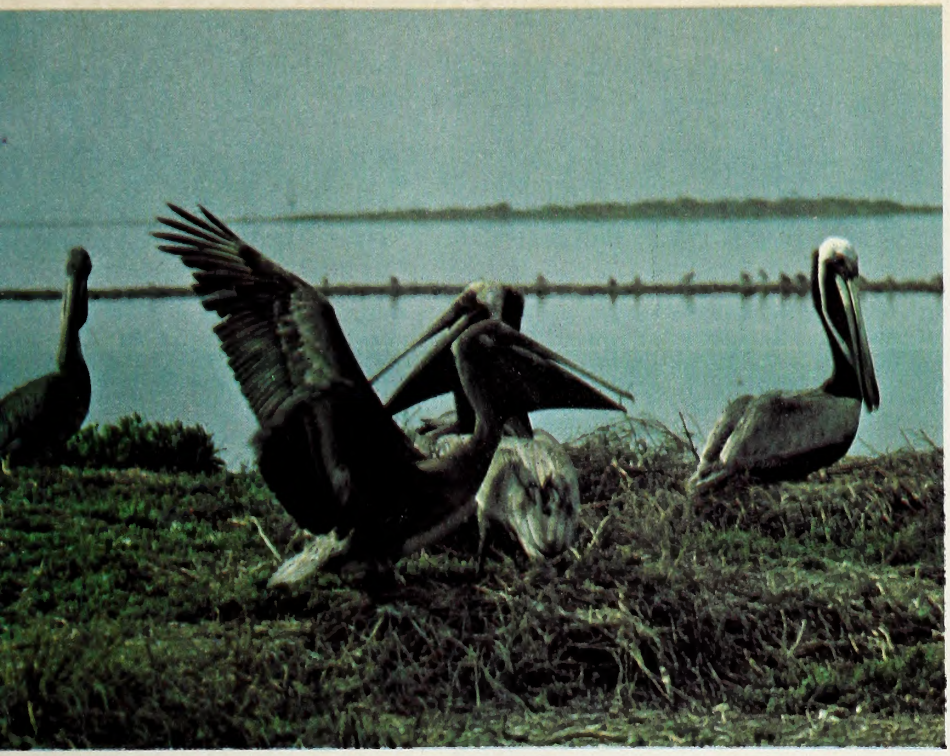
There are insufficient reports to say conclusively, but apparently the number of pelicans nesting in North Carolina declined in the early 1960's; only six nests were reported on the island in June of 1960 and two in July of 1961.

It was during this period that brown pelican populations plummeted in much of the rest of North America. In Louisiana, for example, the population had been estimated in excess of 50,000 birds in the early 1950's. They began showing signs of stress in 1956 and began experiencing catastrophic nesting failures the following year. By 1962, not a single brown pelican was hatched in all of Louisiana. The culprit was apparently a group of chemicals known as chlorinated hydrocarbons which were the main component of many widely used pesticides.

There was apparently no significant decrease in the number of adult pelicans in the Tar Heel State, however, and by 1972, the number of pelican nests on Shell Island had increased to 30; this number had increased to 47 by 1975, and 55 active nests were located on the islands in April of this year.

It was in 1972 that Dr. James Parnell of the University of North Carolina at Wilmington and Dr. Robert Soots of Campbell College began studying North Carolina brown pelican populations as part of Sea Grant supported research on coastal bird populations. They have returned to Shell and other islands in the vicinity each year to note the number of nests, young, adults and juveniles in the area. They have also made plans for more indepth studies of the birds.

Some of the more basic information about North Carolina's nesting brown pelicans has been gathered by recent studies, but more in-



In Florida and along the Gulf Coast, brown pelicans often construct large platform nests in the tops of mangrove trees and dense shrubs, but in North Carolina their nests almost always consist of mounds of sticks, mud and debris on the ground. One-to-three dirty white or brownish eggs are laid sometime between early April and late July by birds in the Ocracoke colony. Incubation takes about four weeks and is shared by both parents.

formation about them is needed if their place as a viable part of the coastal ecosystem is to be ensured.

For instance, it is not known why the birds limit themselves to one nesting site in North Carolina. The next closest brown pelican nesting colony is at the Cape Romain National Wildlife Refuge near McClallenville, South Carolina. There appears to be much suitable habitat between the two areas. It would be helpful to know what factors presently restrict them to the area around Ocracoke. Could they be induced to expand their colony to nesting sites farther south if suitable nesting areas were located?

Could suitable habitat be created by vegetation control on coastal islands or could suitable new islands be created by the proper placing of spoil from the dredging of shipping lanes?

Are the pelicans seen along other portions of the North Carolina coast part of the Ocracoke colony? If so, do they mix with pelicans from farther south? How far south do they migrate; where do the bulk of our State's pelicans winter?

Since chlorinated hydrocarbon pesticides have been banned from general usage, one of the major threats to the brown pelican has been eliminated, but are there other environmental pollutants building up in the coastal ecosystem which could have an equally devastating effect? If so, what are they?

Questions such as these will require considerable time, effort and resources to answer; but answered they must be. Since ours is a peripheral nesting colony, continual vigilance and study will be necessary to ensure their nesting success here. It is hoped that they will always be with us, for the North Carolina coast would be a less interesting place without them.

Go Light for Dolphin

by Joel Arrington
PHOTO BY THE AUTHOR

Outdoor Writer Charley Waterman caught this dolphin on a popper off Hatteras. Mate Bill Bazemore helps out.

NELSON Bryant made a short roll cast and laid the balsa popper on the surface just a few feet abeam of Bob Smirnow's "Yellowbird." Immediately, the school of dolphin streaked from beneath the hull, their tails glowing neon chartreuse. The swiftest of them struck the lure with careless savagery and raced away with others in swift pursuit.

When Bryant lifted his rod tip and set the hook, the five-pounder shot straight up nearly head high, tumbled back into the Gulf Stream and accelerated around the stern to the other side of the boat where it began a memorable aerial display.

It was airborne, it seemed, more than it was submerged. On every leap it flashed iridescent greens and bright yellows. The fish seemed to glow from electric power generated by its frantic movement.

Then Smirnow and I got hookups. It was a three-ring circus. Bryant's fish circled the boat one way, Smirnow's the other. Mine was going mostly straight up. We passed rods around each other as our fish crossed, at the same time trying to keep taut lines. Never had we seen any species more eager to strike artificial lures.

Nelson Bryant writes an outdoor column for the *New York Times*. We were fishing with Bob Smirnow, jet pilot and tackle shop impresario at Hatteras. Early that morning in Hatteras Inlet, Smirnow had advanced the throttles and the "Yellowbird" had surged forward, her twin 130 hp outdrive engines humming and her keel cutting smoothly into the inlet's four-foot swells. The 22-foot, deep-vee hull had made good time on a southeasterly course over a ragged chop, but it was the kind of sea for which the ocean racing hull was designed, and we were soon in the Gulf Stream.

We had found a weed line on the color change which marks the stream's western edge about 20 miles southeast of the inlet. The weather was perfect. A gentle northeasterly blew against the current.

Quickly we caught a dolphin on a trolled feather and held it close on heavy line. Bryant cast a popper to the school that followed and had a strike. The six-pounder leaped as high as our heads. Around the boat it went, jumping and greyhounding and going deep. When Smirnow cut the engines, the school congregated in the shade of the boat, deserting the grass line. When we accidentally tipped the water behind on a back cast, the school raced for the ripples. Then, as the fly hit the water on the fore cast, here the dolphin came back under the boat, hellbent for a taste of our artificials.

If we had tried, we could have caught every fish in the school.

But fishing for dolphin usually is not like that. First, they don't cooperate every time, even if you find them, but the principal reason is that most charter boats provide only heavy trolling tackle, and most anglers take what is given them on charters.

Out of Oregon and Hatteras inlets, where some seasons have produced over 36,000 fish for about 40 boats in June, July and August, charter skippers often troll Japanese feathers or nylon jigs on two flat lines and ballyhoo on two outriggers. Tackle is usually in the 50- to 80-pound class. There are good days and bad, just as everywhere, but an average day produces steady action on fish weighing from less than five pounds to occasionally over 50.

Some skippers will cooperate with anglers who want to try light tackle for dolphin. Others will not. They want every fish boated and they want big fish to hang up back at the dock when pictures are taken. It is good advice to have a clear understanding of what you have in mind before leaving the dock.

Light trolling includes 12-pound to 20-pound class tackle. A few charter craft have 20-pound tackle, but under that you usually have to supply your own. In advance, tell your skipper that you do not care to fish heavy tackle and chances are he will keep it as light as you want, using your tackle or his. If not, look for another skipper.

Even fewer charter captains will permit casting, but enough will to make it worthwhile to search one out. If you find one, value him like your best reel, because with his cooperation you can have more fun with dolphin than you ever before thought possible.

Trolling with light tackle is a start, but the real excitement is in casting to fish with spinning or fly rods. Many days produce ample opportunity.

First, you should locate fish by trolling. Dolphin stay near the surface, most often under some kind of cover—a board, plank, or any kind of flotsam, but especially along weed lines. Wind and currents form meandering lines of sargassum weed where bait, notably flying fish hide. Dolphin hang around for food and, I believe, for shade. So troll weed lines when you find them and any floating object in blue water. Dolphin sometimes come well inshore of the Gulf Stream, but, for the most part, they are blue-water fish.

Also, they are school fish up to a certain weight. Below about 10 pounds, they will be in schools of from several to many. Above 10 pounds, they are often in pairs—a bull and a cow.

This schooling instinct pays dividends for the light-tackle angler, because when you find one, you frequently find many. Often, a school will follow a hooked fish right to the boat. In clear water, you will see them darting and milling about completely unafraid of your tackle or your boat.

Anticipating that, it is well to have rigged and ready freshwater spinning rods with 10-pound or 12-pound test mono. I like a medium action six-foot rod. Lures, attached to 30-pound test mono leaders, may be white or yellow bucktails in the ¼- to ¾-ounce range or perhaps metal squids or spoons. If fish are few or reluctant to take artificials, tip a jig with a three-inch strip of squid or fish belly. Some days, virtually any lure works, but you don't need treble hooks. They are too difficult to remove and dolphin are too easy to hook; strong, single hooks are better.

When a school follows a fighting fish to the boat, make a short cast astern. Ask the skipper to put the engines in neutral. Sometimes you can keep dolphin around the boat as long as you have a fish on. I like to leave a "Judas" fish on a short, stout line with the rod in a holder, but if it gets in your way, you still may be able to keep fish nearby as long as you keep one on and fighting.

Another trick, and it's a good one, is to hold fish near the boat with chum. Cut up some baitfish, bonito, or anything handy and drop a little over the side, but just enough to keep the dolphin close. You don't want to feed them too much or have to chop bait unnecessarily.

Reels with good drags are essential. Dolphin are fast and powerful for their size, so nothing but the best drags are adequate. Sports with poor equipment are responsible for some charter skippers banning light tackle from their boats.

When you have caught dolphin once in the manner I have described, you will immediately see the possibility of taking fish on a fly. Although it is not impossible to fish long rods from the stern of charter craft, it certainly is not easy. The saving feature is that long casts are not necessary. You may roll-cast, or even simply dapple a fly on the surface with only a few feet of line beyond the tip.

It's much easier, and more fun, to fish from an open boat, one with a console amidships, outriggers which can be laid snugly along the gunwales and twin outdrives with power to spare. The radio antenna should fold down out of the way of errant back casts. Such craft are not available for offshore charters in North Carolina.

Fly leaders should be about six feet long and taper to about 10-pound test and they should be tipped with 30- to 60-pound test mono shock tippets. An 8½-foot rod balanced for a #8 or #9 weight-forward line is perfectly adequate for school dolphin of up to 10 pounds, provided the reel has at least 100 yards of backing. A simple click drag, single-action reel will handle 90 percent of the dolphin you will be able to hook on a fly.

For the remaining 10 percent, you will need a longer, beefier rod and a fly reel with a good drag and more than 150 yards of 20-pound test backing. Large fish will often swim in the shade of flotsam, and they may be seen from a distance, especially from a high position on the bridge. You should position yourself on the bow, instructing the skipper to run you slowly toward the fish. Here is an exception in dolphin fly-fishing where a long cast *is* necessary. That lone fish is not going to let a 40-foot boat come too close, but how close depends on the fish. You may be able to reach it with a fly before it disappears.

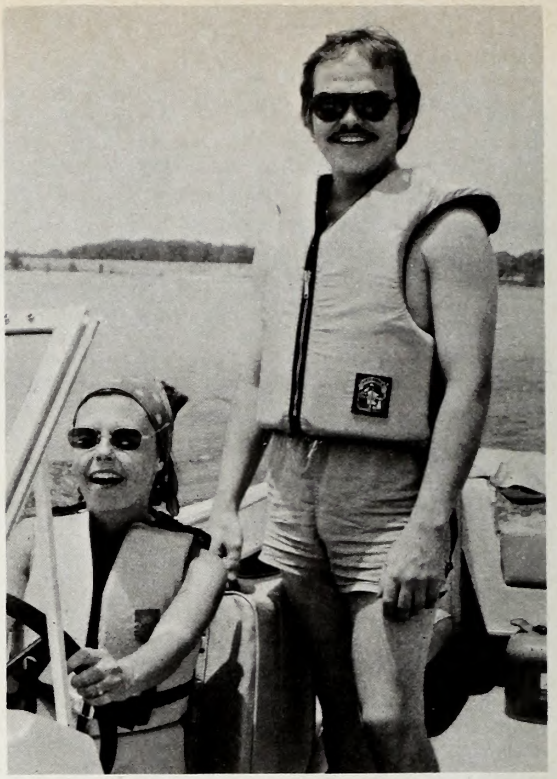
If you hook a large fish, the captain should be instructed to run the boat slowly with the dolphin as long as it is taking line. Keep the pressure on and you can boat a surprisingly large fish with a nine-foot fly rod.

Good flies for dolphin are streamers of almost any color on 1/0 to 3/0 hooks with strips of mylar tied in. Popping and skipping bugs with hair or feather tails at times are irresistible, and great fun to fish. Whether using a streamer or a

• **continued on page 27**

STEM TO STERN

by Ed Jenkins



Personal flotation devices (you may still call them "life jackets") are now really comfortable to wear and are far less bulkly than the old "horse collars."

WHO SAYS PFD's ARE NOT WEARABLE?

● A new type of Coast Guard approved personal flotation device is steadily catching the eye of the boating public. This increasingly popular PFD, classified as a Type III device by the Coast Guard, provides sufficient buoyancy to float a person with his head and neck out of the water. Its appeal to boaters over the typical wearable PFD is due to its comfortable, lightweight design.

While these newer devices are more expensive than the "horse collar" type buoyant vests, prices for the newer models are declining as more manufacturers, spurred by public demand for a truly wearable lifesaving device, recognize the market potential for these products.

The wearing of personal flotation devices while in a boat, as with the wearing of seat belts in an automobile, continues to be resisted by the public. Statistics show that both seat belts and PFD's, when used, greatly increase one's chance of survival in an accident, but unless a person is wearing them when the accident occurs, seat belts offer no protection while PFD's provide only limited assistance. In the great majority of all fatal boating accidents occurring in 1976, accident reports indicate that PFD's were aboard but were not worn. Instances of boats overturning trapping PFD's under them and of people falling overboard unable to reach the device in the boat are just two examples why lifesaving devices that are aboard but not worn may be of no help to some victims.

The main reluctance people have to wearing PFD's is an issue of comfort. When the discomfort of wearing a bulky and hot life preserver or vest is weighed against the slight possibility of being involved in a boating accident, safety usually is rejected in favor of comfort. Now that the new Type III PFD's are available, the word "wearability" is finally being associated with lifesaving devices.

While wearable PFD's offer the greatest protection to individuals in boats, they make poor throwing devices and are more difficult for people in the water to hold on to than buoyant cushions or ring buoys. For this reason, a throwable type PFD, such as a buoyant cushion, is required on boats 16 feet and longer in length. The idea here is that smaller boats are more maneuverable and can get back to a person who has fallen overboard sooner than most larger vessels. In order to provide the most assistance to a person who has fallen overboard, a buoyant device that can be accurately thrown to a person in the water is highly desirable on large boats.

If there is one *bad* thing about PFD's, it is that they provide a false sense of security to some individuals. Many people feel as long as there are lifesaving devices aboard the boat, they are safe. Boating accident statistics point out this is not the case. PFD's are only reliable when they are in good shape and are properly used.

A wearable PFD should be fitted to each person on the boat before it leaves the dock. If a family has a boat, every member should have a PFD assigned to him. It should be adjusted in size and have the individual's name marked on the device. This will ensure the proper device can be quickly located and put on in case of an emergency.

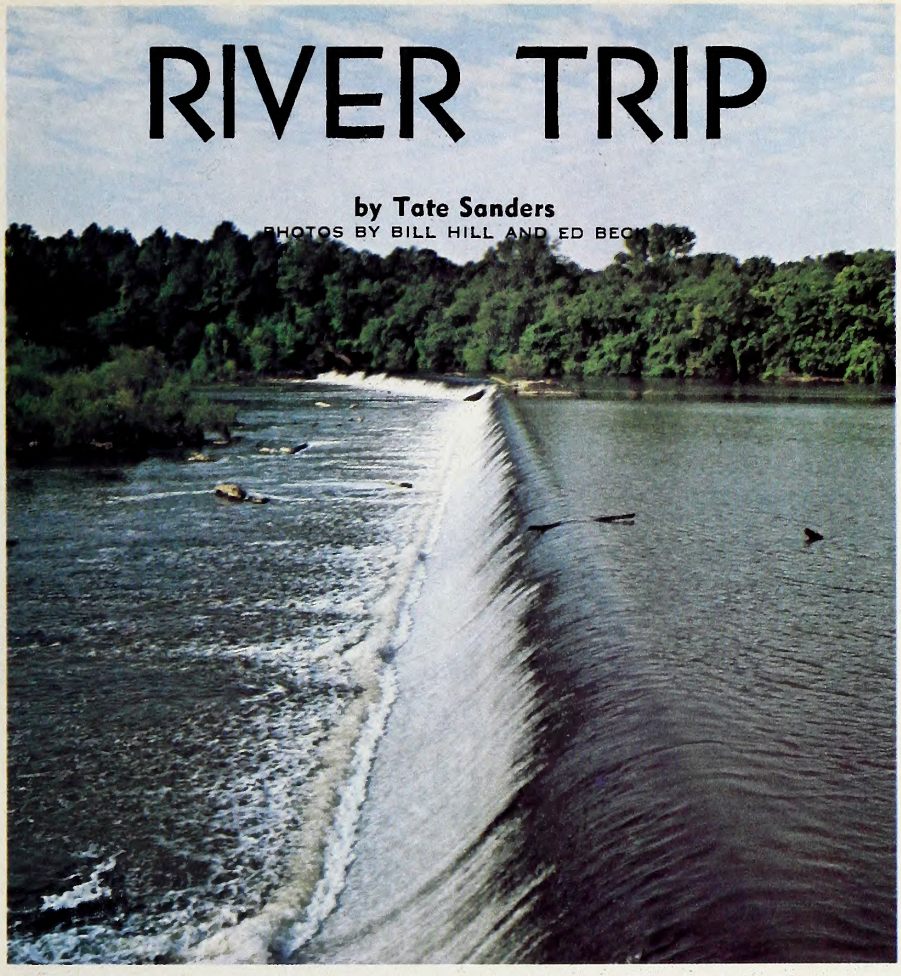
"Not necessary," one may say. Then he may wish to try this experiment. If his child is a good swimmer, he should have him get into the water over his head and throw him a randomly selected wearable PFD from the boat with instructions to put it on while in the water. Time should be kept as the child adjusts the straps, locates hooks and rings, ties knots and tightens the device around himself so he is properly supported in the water. I think parents and youngsters will be surprised at how long it takes and how difficult it is to don one of the devices in the water if it is not previously adjusted to size. When one imagines how this difficulty will be compounded by waves, possible injury and panic, it is easily realized how such a small step, as having properly adjusted PFD's readily available for each person, can play such an important part in an actual emergency.

Again, the key word is *wearability*, and that's what gives the newer Type III devices an edge over the competition. As these devices become increasingly popular and more widely used, close attention will be given to boating accident statistics to determine the exact role the new PFD's are playing in reducing recreational boating deaths. ◆

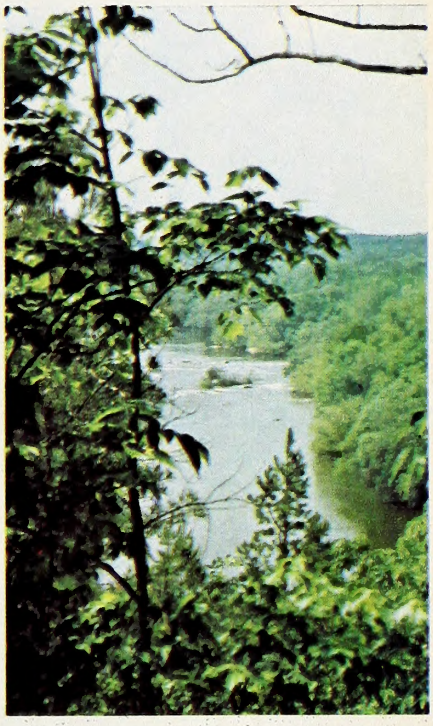
RIVER TRIP

by Tate Sanders

PHOTOS BY BILL HILL AND ED BEC



Buckhorn Dam (left), the starting point of the river trip, is one of the earliest hydroelectric plants in the South. This photo of the Fish Traps (below) was taken from a Raven Rock State Park overlook.



AN hour's drive south of the Research Triangle area (Raleigh-Durham-Chapel Hill) is one of the few remaining places in the lower Piedmont that remains relatively unchanged by the hand of man. The Cape Fear River is formed when the Haw and the Deep meet at Moncure in Chatham County. Six miles down river Buckhorn Dam, built in 1907 by the Cape Fear Power Company, straddles the river, creating a half-mile wide reservoir on the upstream side and a 20-foot high waterfall going down the river. Below this point for 21 miles down to Lillington in Harnett County, the river hasn't changed much since Europeans arrived here 300 years ago.

Turning onto State Road 1921 from the village of Corinth at N. C. Highway 42, we caught occasional glimpses of the river valley to our right. Soon, the pavement ended, and the road started to head down the hill into the river valley through the woods. Two dusty, rutted miles later, the road became a path, and turned sharply to the right. Another hundred yards, and we parked the car on a dike and walked out to the concrete parapet overlooking Buckhorn Dam. The roar of the water going over the falls was a welcome sound, because our canoe was already overloaded with three people and photographic gear, and we knew that we needed good river conditions to successfully negotiate the rapids and falls that lay down river. The day in late April was fine, and an osprey circled overhead.

Looking at the water moving swiftly downstream, I had mixed emotions about our trip. I had gone down this stretch before; and I knew that there were no major difficulties to be encountered. Nevertheless, rivers have a way of seeming dark, sinister, and dangerous—not at all like the friendly mill pond that I usually canoe on. Also, I had crossed the river at Lillington and seen the stream out of its banks, millions of gallons of turbid water rushing downstream after three days of heavy rain. Putting the canoe into the river at such times would have been an invitation to disaster. But, light thundershowers a few days earlier had brought the level of the water up to within a foot of its banks, and conditions looked perfect. So, we loaded our canoe, got in, and headed down river with the current.

It was an absolutely beautiful day. The air was a bit chilly, but we were protected from it down on the surface of the water. Soon, the roar of the falls died away, and we were moving down the river, watching fish jump, and looking for the osprey that we had seen earlier. I took out my rod, and made a few casts, but couldn't interest anything into taking my spinner. After about a mile of this, we became aware of a dull roar in the distance; we were coming to the first set of rapids.

These rapids are the trickiest ones encountered on the trip. On an earlier trip, I had attempted to negotiate them by going down on the right, but found that I couldn't

Be sure to have your canoe load (above) well balanced; have life-saving devices readily accessible at all times. Fishing on the River (below) continues as an age-old pastime.

Lanier's Falls (above) makes for exciting white-water canoeing. Be sure to wear your life jacket at all times in situations of this type. Many locations along the River (below) had the appearance and some of the vegetation of mountain habitat. Wildlife was evident but difficult to photograph. Signs of raccoon and deer were seen.

get through. The middle of the rapids is the best place, but with a loaded canoe, we decided to try to get down the left side of the river. This is probably the safest place. We cut in towards the bank and passed an island on our right. Now, we were well into the rapids, and were working hard to spot the passages through the rocks. The water got shallow, and we grounded the canoe on a rock, pushed off, hit another rock.

Things were not looking good. It appeared to be time to get our feet wet, so we got out of the canoe in knee deep water, trying not to step between the rocks, and pulled the canoe onto a rock shelf to think things over. From our vantage point, we noticed the similarity between this segment of the river and a mountain stream. We were in a side passage of the river, with the island and the river bank only about 100 feet apart.

After a rest, we thought we could see a series of runs that could be negotiated, so off we went. We ran through the rapids, cut the canoe to the left and went over a small fall. Then, we moved quickly to the right traversing a pool, cut back to the left, shipped a little water, headed into another run, hit a rock, and the canoe went over. We were all wearing life jackets, but the rushing water was about to send our packs, paddles, and assorted gear downstream. We were in a fix. Waist deep in the torrent, we grabbed everything, walked it over to the island, and threw it up into the most lush poison ivy growth I have ever seen. At this point, we had run out of alternatives.

If you have to turn over your canoe, rowboat, or whatever, in a lower piedmont river, this stretch of the Cape Fear is the place to do it. Upstream, the Haw River carries most of the domestic and industrial sewage from the towns of Greensboro and Burlington. The Deep River is in better shape, but it carries sewage from High Point. However, the biological action of the river has cleaned this up by the time it gets to Buckhorn Dam. North Carolina adopted a water

Mountain laurel (above) was abundant along the south bank of the River. The blooming season in this region is May. A single stairway (below) from the top of Raven Rock to the River is designed to fit naturally into the wooded surroundings.

This meadow (above) forms a portion of the canoe camping area at the lower end of the Park. Tim Pegram, Ranger I, (below) observes Little Creek.

quality classification system years ago. Water designated "A," "B" or "C" is protected by fairly strict standards. Unfortunately, these standards are not always met, but generally, the quality of the water in the rivers of North Carolina is pretty good. This stretch of the Cape Fear is "A-2," which means that it is suitable for drinking with minor treatment.

Clean water supports many types of fish, birds, and water plants. This "species diversity" is used as an index to water pollution: the cleaner the water, the more different types of plants and animals live there. In this area of the Cape Fear, one can find largemouth bass, (a storekeeper in Corinth told of a 7½ pounder caught the day before), channel catfish, bluegills, redear sunfish, and many other species. Cracked mussel shells on the rocks indicate the sizable population of raccoons. Wild turkey, deer, and bobcats live in the forests of the valley. Also, there has been a confirmed sighting of a bald eagle at Raven Rock State Park which is located on this stretch of the river.

We used a low lying limb of a tree to dump the water out of the canoe. We had managed to get one camera, all of our spare clothes, and my lunch wet. We loaded the gear back into the canoe and walked it around the end of the island to the main stream of the river. We were now at the tail end of this set of rapids, and we could see calmer water downstream. Catching the tail end of the rapids, the canoe moved swiftly through the rushing water, and we were on our way again.

The water had not been cold, but we were soaked. The sun felt good, and soon it would dry us out. The river at this point was about two feet deep, and it was clear enough so that we could see the bottom. We were moving right along. Soon we encountered another set of rapids. Here the river did not drop, but ran through the rocks. At low water conditions, this can be a tricky place, but today, all that was necessary was to dodge the rocks which could be spotted by swirls

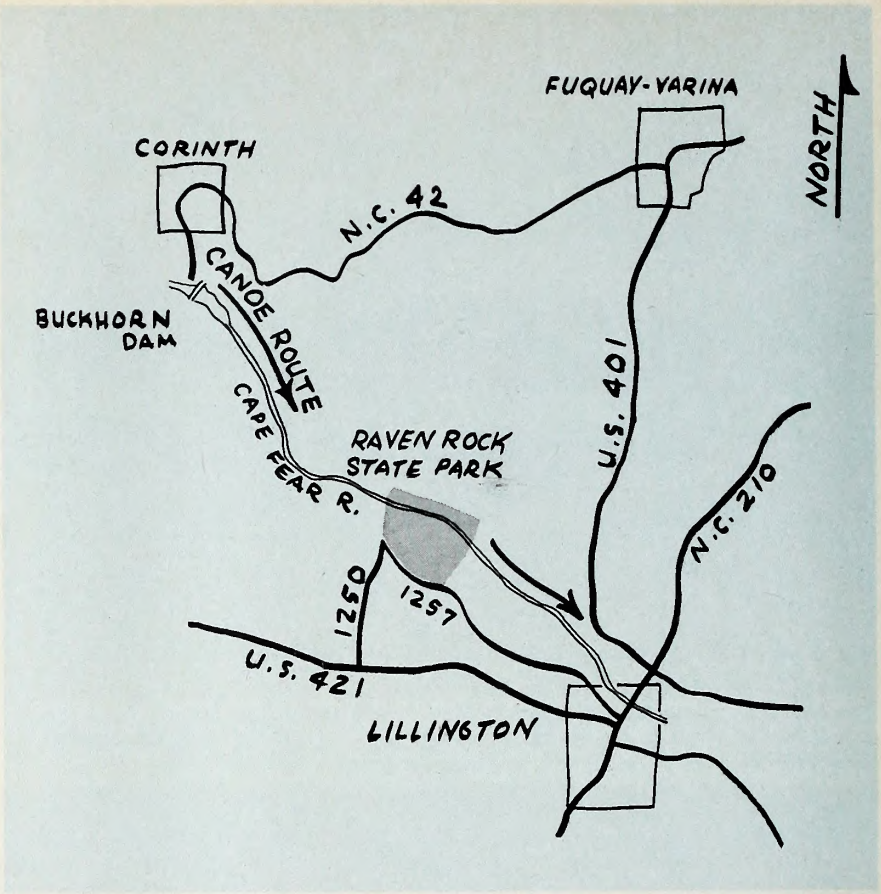
in the water.

My earlier apprehension about the river had dissolved. Going down a river in a canoe places one on intimate terms with the stream—the feeling is very different from crossing a bridge or even standing on the banks. The mystery of the river gives way to a feeling of discovery and delight.

The south bank was beginning to change from black willows and tulip poplars lying low against the water to bluffs and low rock cliffs topped by cedars and pines. These increased in size as we went along, and soon, the river bank had changed to rock. Getting a closer look at these, we could see the ridges and holes that the river had carved in them, flowing past for indeterminable amounts of time. Soon, we saw a boundary marker, and we were inside Raven Rock State Park. We could hear Lanier's Falls coming up in the distance. These provide the wildest whitewater ride on the river, and a small island above the falls just to the right of the main channel is a perfect spot to eat lunch and figure out a way to take a canoe over them.

We pulled the canoe out of the water, and walked around the island. It is mostly rock, but accumulated soil in the middle of it has provided a miniature garden spot with several cedars and pines flourishing. This is probably the most beautiful spot on the river. The island is only 30 feet from the high south bank, but the fall is spectacular, since a miniature gorge has been created and quite a lot of water is trying to get through a narrow space. Don't try to go through this in a canoe, but a kayak would probably make it.

On the other side of the island, the water drops twice, going over the falls. The first drop is no problem, but the second drop, depending upon how one tries to go through, will either give you a good ride, or turn you over. We divided up dry sandwiches and ate lunch, with the water swirling around us on both sides of the island. After the break, we unloaded the canoe, picked a spot to go over, and two of us shot the falls. This was so much fun, that we had to do it again. This time, I stayed on the rocks and our photographer, Bill Hill, went over. The afternoon was getting on, so we loaded our gear, and went on down the river.



Soon we came to the "Fish Traps." This is a fine little rapid that shouldn't turn anyone over, and is very easy to negotiate. It is an exhilarating run of about 100 yards, and is a lot of fun. It gets its name because at low water, the Indians and early settlers used to set nets here and herded the fish into them. A mile below, we came to the Raven Rock. This is the largest rock cliff on the river, and deserves more attention than I can give it here. We tied up the canoe, and climbed up the bank. The rock has trees hundreds of years old growing up underneath it, and is topped by mountain laurel and rhododendron. It seems to be almost 100 feet high from its base, and might be 150 yards long. Standing at the base, you can't see the top because of the overhanging cliffs.

Soon, it was time to start moving again. We were beginning to get tired after hours of paddling and running rapids. The cliffs on the south bank of the river were casting long afternoon shadows, and it wasn't as warm as it had been earlier. After several more bends in the river, we saw what appeared to be a buoy near the bank. We

• continued on page 27

To Take This Trip

• Access to the Buckhorn Dam area is controlled by Carolina Power and Light Company. It is their present policy to allow the public access here, but if litter and other problems increase, the area is subject to closure. Please use it wisely.

• For information on the Canoe Camping Area at Raven Rock State Park, contact Park Superintendent Howard Hodges, Raven Rock State Park, Rt. 3, Box 447, Lillington, N.C. 27546.

• Park staff can be contacted concerning river conditions. A permit is needed for use of camp area. At present, no drinking water is available at camp sites, but should be by mid-summer.

• The only automobile access points are at Buckhorn Dam and at Lillington. Make travel arrangements accordingly.

• Be sure to wear Coast Guard approved life jackets. Use extreme care at all times.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Endangered Species Art Prints

The Carolina Conservationist Program is described on page 26, and explains how you can obtain the red-cockaded woodpecker print (16 by 20 inches, numbered and signed for $25, or signed only for $10) and the current print of the brown pelican on the same basis. You'll be aiding all of North Carolina's rare and endangered wildlife.

National Safe Boating Week is Here

This is one week you should observe every week of the year. Although the official designation is July 3-9, we hope that you will make it a year 'round observance.

New License?

Combination hunting and fishing licenses expire July 31; don't forget to buy your new one by then. Regular fishing licenses are valid through December 31.

Boating Access Areas

Vandalism continues to be a serious problem on the Wildlife Commission's boating access areas throughout the state. These areas are constructed for the free use of all of the state's boaters, and funds that must be used to repair or reconstruct facilities because of deliberate destruction mean less money for new areas which are needed in many sections of North Carolina. Do your part in helping keep the boating access areas in good condition.

Crows Out of Season

Yes, that's correct; the crow hunting season is closed starting July 4 until the new season comes in September 26 and runs through November 26.

Endangered Species Conservation Program

by Frank Barick

HOW does a species become designated as "endangered?" Once so designated, what can be done to ensure its survival? Who pays the bill? These and other questions about endangered species have become more and more frequent recently. Now that the Wildlife Resources Commission has initiated a program in cooperation with the U. S. Fish & Wildlife Service for the conservation of endangered species, we can more readily provide some of the answers.

About 170 animal species in the United States have been designated as endangered by the U. S. Fish & Wildlife Service. Fifteen of these are listed as occurring in North Carolina, but some have not been observed here for many years (see article on page 4). One of the first acts required under the cooperative agreement executed with the U. S. Fish & Wildlife Service for preservation of endangered species was official designation of these 15 species as endangered by the Wildlife Commission. This was done by the Commission at its meeting on April 25, 1977, thereby providing for assumption of protection responsibility by the Commission. Until that time, primary responsibility for protection lay with the U. S. Fish & Wildlife Service.

Other species may be added to this list either by the Service or the Commission. The U. S. Fish & Wildlife Service designation process provides opportunity for comment by the wildlife agencies in the various states, but the Service reserves the ultimate authority for designation at the national level. Once the Service makes such a designation, the states where the species exist are obliged to add their official designation of endangered status. Failure to do so would provide grounds for termination of the state's federally funded cooperative work program. In addition, the state may designate other species, not on the federal list, as being endangered within its borders. Federal funds may be allocated for the conservation of these species, but first priority must be given to species on the federal list.

Assignment of endangered status to a species is the result of intensive studies by wildlife scientists and public review of the proposal to designate the species as endangered. The public review process serves to identify the impacts of such designation upon various interests, such as land use and commercial and industrial development. Consideration of both biological needs and the impacts of designation helps to assure that there is ample justification for the "endangered" designation.

To assure that the Wildlife Commission has full information about both the need for designation and the impacts of designation, all proposals for designation are to be screened by an officially designated Advisory Committee. This Committee, which is shown on the chart, is composed of ten members which represent the scientific community, landowner and industrial interests, and the public.

Once a species is designated as being endangered, it qualifies for intensive study to determine as fully as possible the extent of its distribution within the state, its particular needs for survival, factors adversely affecting it and measures needed to provide for its restoration to viable levels. These studies are funded (from 2/3 to 3/4 of total cost) by the U. S. Fish & Wildlife Service through the Wildlife Commission.

When restoration procedures are developed, they are implemented through the Commission and other concerned agencies. Among the first elements in the restoration program is protection from taking and commercialization in accordance with regulations adopted by the Commission and enforced by its wildlife enforcement officers. Other measures include habitat acquisition, habitat management, live-trapping and transplanting. These measures would normally be conducted by the Commission's Divisions of Game and Inland Fisheries. In addition, other public land-owning agencies would also participate in these efforts. Notable among these are the U. S. Forest Service and military installations.

Another action, performed by the U. S. Fish & Wildlife Service, is the designation of "critical habitat." This may be any area of land or water determined to be critical to the survival of a species. While this is usually on publically owned land, it need not be. The primary constraint created by such designation is that no federally funded program may be executed within such areas that would have an adverse impact upon the species for which the critical habitat was designated.

Since so many state programs are federally funded, and since there are several federal agencies owning land or having an interest in endangered species, it is essential that all of these agencies are kept aware of all work done on behalf of endangered species. To provide a forum for such awareness, the Commission has established an Interagency Endangered Species Task Force with representatives from nine state and seven federal agencies. The task force will meet periodically to discuss recent developments and to keep each other up-to-date on actions of their respective agencies as these actions relate to endangered species. Members of the task force will also assist in developing study and management program proposals for screening by the Advisory Committee and implementation by the Commission (see organization chart).

Who pays the bill? As indicated above, endangered species research and restoration is a federally funded program in which the states are reimbursed for either two-thirds or

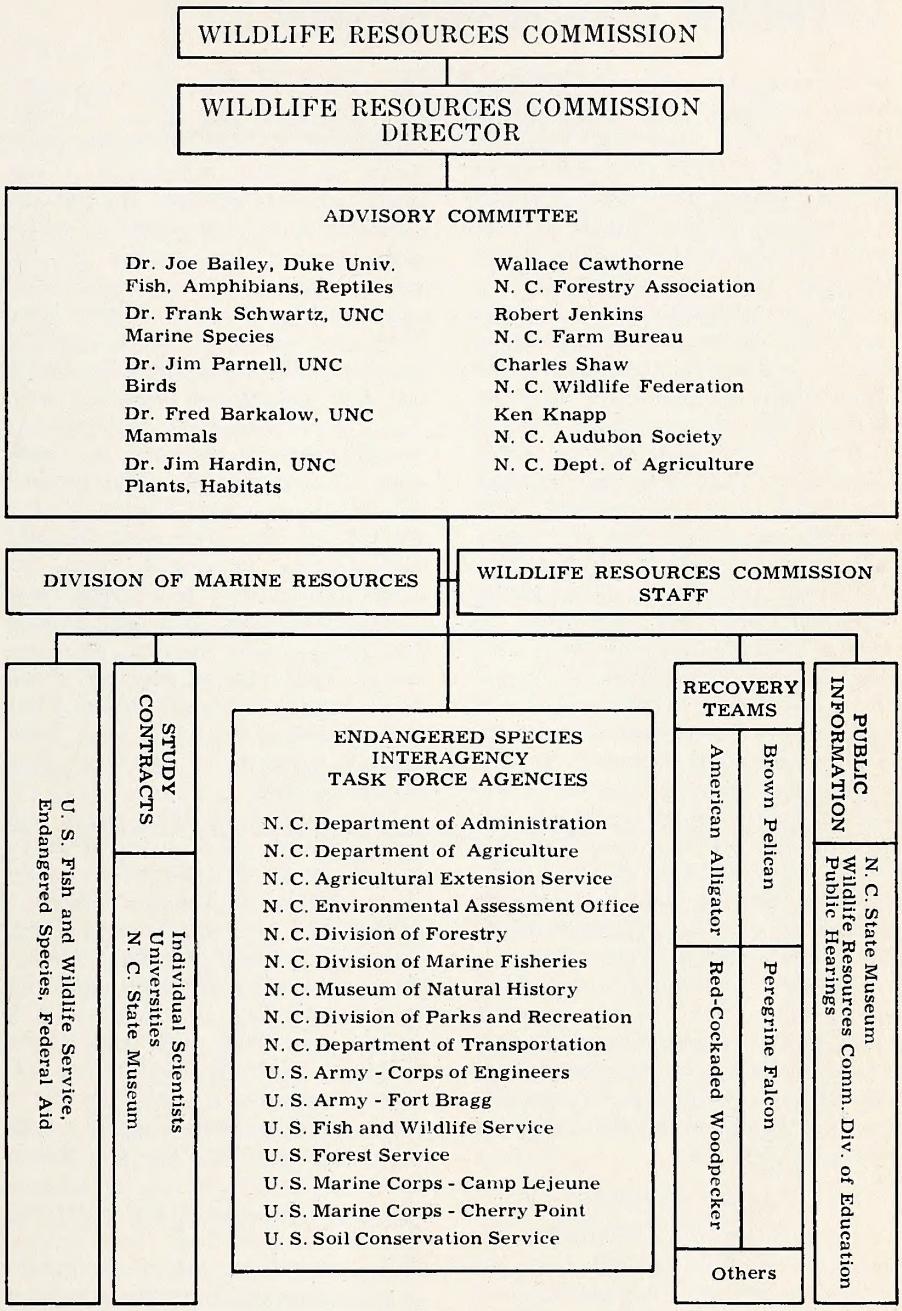
three-fourths of their expenditures in behalf of a particular species. The three-fourths reimbursement rate applies only to those cases where a project is jointly undertaken by two or more states. If, for example, North Carolina work on the brown pelican is done in cooperation with South Carolina and/or other coastal states to the south, it would qualify for three-fourths reimbursement by the U. S. Fish & Wildlife Service. The federal money is appropriated annually from the general fund; that is, not from a special excise tax like the Federal Aid in Wildlife Restoration Funds.

The state share of the project can come either from the Wildlife Commission or from another agency or institution providing the research personnel. Many colleges and universities have departments of biology staffed by competent research supervisors that need money to support fellowships in their graduate programs. A substantial part of the cost of supporting a graduate student program is usually institutional "overhead." The pattern that is emerging shows the federal share of the funding used for student stipend and expenses, with institutional overhead and supervision constituting the state's share.

In Commission-sponsored development projects, the state share would have to come from the Commission's budget, which of course is supported by the sale of hunting and fishing licenses. The Commission's contribution would be in the form of salaries and expenses of those already on the staff whose work in this area would increase as a result of the implementation of this program. It would also include payment for temporary labor and supplies.

The 1975 Legislature authorized the Wildlife Commission to establish a contributions program such that those who do not hunt or fish could contribute to the research, protection and management of nongame, rare and endangered species. This program, "Carolina Conservationist," was implemented in July, 1976. Revenues from this program will be applied to the state share of endangered species research. Detailed information on this program is available by writing Carolina Conservationist, Wildlife Commission, 325 N. Salisbury St., Raleigh, N. C. 27611. It is described in the article on page 26.

ORGANIZATIONAL CHART
NORTH CAROLINA ENDANGERED SPECIES CONSERVATION PROGRAM



During the early stages of the 1977 Legislature, consideration was given to the introduction of a bill that would provide general fund monies for the support of the state's endangered species program. Consultation with the N. C. Wildlife Federation and other sportsmen, however, indicated that the sportsmen would prefer that their license money continue to be used to support the program rather than weaken the autonomy of the state's wildlife conservation program. This will not be a heavy burden for the sportsmen to bear since the total amount would be less than one percent of the Commission's annual budget.

As of this writing, we have prepared the first draft of our federally funded research and development program. After screening by the Interagency Task Force and the Advisory Committee, it will be formally transmitted to the U. S. Fish & Wildlife Service. Upon approval by that agency, the Commission will initiate study contracts and development programs. These will be described in future articles.

YOU CAN BECOME A

Carolina Conservationist

● "I have just recently moved to North Carolina," said the lady on the telephone, "and I'm very interested in wildlife. The state from which I moved had recently begun a program to help nongame wildlife and endangered species. Does North Carolina have such a program?"

The lady's question was not unusual for there are thousands of North Carolinians, both native and newcomers, who share her interest. It is a rare person whose interest is not stirred by the various forms of wildlife. Most folks derive pleasure from daily encounters with wildlife—be it the sight of a cardinal perched outside a kitchen window, a flock of Canada geese noisily winging their way northward in spring migration or the sight of a deer bounding from a wooded meadow. Most people readily agree that much of the enjoyment of camping, hiking, canoeing, nature photography, bird watching and other outdoor activities is derived from seeing or the anticipation of seeing wildlfe. There is no doubt that without our rich and diverse wildlife resources, our environment would be a much poorer place to live.

Of course, the answer to the lady's question is "yes." North Carolina does have a program, conducted by the Wildlife Resources Commission, which was established specifically to help nongame wildlife and endangered species.

Source of Funds

Since 1947, the N. C. Wildlife Resources Commission has been responsible for the management and protection of all wildlife in North Carolina. Unlike other agencies of state government, however, the Wildlife Commission does not receive revenues from the North Carolina general tax fund. Rather, it is supported almost entirely by revenues from the sale of hunting and fishing licenses and Federal taxes on sporting arms and ammunition. The net result is that the wildlife program in North Carolina, as in most other states in the Union, is supported by a rather small portion of the total population.

Since 1947, North Carolina sportsmen have contributed over $76 million in license money alone toward the restoration, protection, management and research of North Carolina's wildlife populations; but much more is needed. Habitat destruction and environmental pollution take an irreversible toll of wildlife each year. Already 15 wildlife species, none of which have ever had an open sport hunting season, have been officially designated as endangered in North Carolina. The endangered red-cockaded woodpecker, for instance, is a resident of southeastern pine forests. They were once plentiful in the Tar Heel State but have been rapidly disappearing in recent years because the mature pine trees they depend upon for food and shelter are being cut for lumber. More research needs to be done on these birds, but it is already known that special efforts to protect their habitat will have to be made if they are to survive.

The endangered bald eagle and brown pelican are both native North Carolina birds which feed primarily on fish. Both are on the endangered species list. Their populations plummeted when pesticides accumulated in their food chain, affecting their metabolism and causing them to lay eggs with very thin shells. In most cases, the eggs broke before the parents could hatch them. As a result, there were fewer young being brought into the population to replace those dying of natural mortality. Recent restrictions on the use of pesticides have helped ease the problem, but environmental pollutants still threaten these and other species of wildlife.

The endangered manatee, generally associated with Florida waters, is known to visit southeastern North Carolina rivers; but little else is known about them here. There are thought to be fewer than 1000 left in the world. Similarly, the cougar is thought to inhabit the more remote areas of the coastal swamps and mountains of North Carolina; but there is no concrete data to substantiate this. If they are indeed present, there is no information available on their numbers or habitat requirements here.

Other species, such as the peregrine falcon and golden eagle, once resided in North Carolina but now they only pass through — if they visit this State at all.

We Need More Information

Much research is needed to fill gaps in information on these and many other species. Recognizing this, the 1975 General Assembly passed legislation authorizing a contributions program to the Wildlife Resources Commission, to help finance work presently being done for nongame and endangered wildlife and to expand those activities. If funds become available, special research projects are planned for the American alligator, brown pelican, peregrine falcon, manatee, cougar, Indiana bat, gray bat, red-cockaded woodpecker and bald eagle for this year (1977-78).

The contributions program, entitled "Carolina Conservationist," was implemented in July, 1976. It allows those wildlife enthusiasts with an interest in nongame, rare and endangered wildlife to contribute funds to be used specifically for research, protection and management of those species—to help ensure that they will always have a solid place in North Carolina's future.

Under the provisions of the program, a nongame, rare or endangered species will be "featured" each fiscal year. A painting of this featured species will be made by noted wildlife artist Duane Raver, with a limited edition 16- x 20-inch full color print, signed and numbered by the artist, going to each person who contributes $25. Signed (but not numbered) prints will go to those who contribute $10 and a "Carolina Conservationist" shoulder emblem will be given to all who contribute $2 or more. Contributions are tax deductible and will be matched on a two-to-one basis with Federal Aid funds made available through the Federal Endangered Species Act of 1973. In other words, for every dollar donated, two will be made available to North Carolina from the Departments of Interior and Commerce.

Why don't you take an active interest in the future of North Carolina's wildlife? Become a "Carolina Conservationist!"

For more information write, "Carolina Conservationist," N. C. Wildlife Resources Commission, 325 N. Salisbury Street, Raleigh, North Carolina 27611. ♦ **Curtis Wooten**

- Letters
- Comments
- This & That

BACK OF THE BOOK

North Carolina Trails Association

An open meeting to organize a North Carolina Trails Association will be held on Saturday, August 6, 1977, 1 to 4 p.m. at Morrow Mt. State Park Pavilion.

Primitive camping and facilities for all types of trail enjoyment are available at Morrow Mt. State Park and/or in nearby Uwharrie National Forest for those wishing to spend the weekend. For further information call or write David Pyles, Rt. 2, Box C, Morrisville, N. C. 27650; Phone (919) 549-8411, Ext. 2851.

Responsibility?

Dear Sirs:

In reference to the article *Mobile Skeet, Off Season Eye Sharpener,* by William G. Murray, in the March issue of North Carolina Wildlife, I feel that I must write you and let you know my feelings, not about the Norfolk, Va. mobile skeet trailer, but of the implied use. That is, to take it out on back roads, set it up where you please, and shoot away. This sounds to me as if you, Mr. Murray have a major flaw in your thinking: that to go out along on an empty piece of property and to start banging away will not disturb anyone (noise, litter, etc.).

Mr. Murray does not imply in his article that he gets permission to shoot skeet in these out of the way locations. If he does, that is fine, but what about those people who, after reading his article, build a mobile skeet and abuse the people and landscape around the country. Do you not feel, Mr. Murray, that it is your responsibility to obtain permission yourself and expect others that follow you to do the same. In the article, I feel that he should have stressed this a great deal. This is a time in our era of hunting and other use of the out-of-doors that many anti-hunting organizations frown greatly upon the hunter attitude that no one out there in rural America has feelings. They do, and they work hard on that land and they pay the taxes on that land, and they are the ones who provide you with an opportunity to enjoy yourself. I feel that no magazine should publish articles that do not stress the ideals of conservation, which means wise-use, therefore, a responsibility to all that you are not abusing the rights of others in whatever you do.

Sincerely,
Paul C. Manns
New Bethlehem, Pa.

DOLPHIN from page 17

popper, you almost always see the strike.

Despite claims that dolphin take artificial lures more readily than any species, there are times when you cannot get a dolphin to take a cast lure. I've seen both extremes of aggressiveness and lack of interest, and I've seen them when you had to work a fly a certain way to get them to hit. Once, when we were chumming, they would hit only a slow-sinking streamer. If you moved it one inch, the dolphin would refuse it. However, your best advice is to start with a slow retrieve, but keep the fly coming. Give the fish a chance to look it over. If they are disinterested, strip rapidly. Then try the dead drift trick. A little chum thrown overboard will usually turn on reluctant fish.

Dolphin are available out of sportfishing ports from Oregon Inlet, where they catch a great number, to Cape Hatteras, where they catch the most, and southward to Morehead City, Wilmington and Southport.

Light tackle adds a new dimension to fishing for dolphin. At the end of a day offshore, anglers will not have as much meat for the freezer as is possible with heavy trolling tackle, but they will have had much more fun.

RIVER TRIP from page 22

approached it and noticed that steps had been placed down the river bank. The buoy marked the tying up place for the Raven Rock Canoe Camp. This hadn't been here on my earlier trip. We decided to explore it, so we tied the canoe off on a tree and climbed up the steps.

A deep, wide, green meadow stretched in front of us. Ed Beck, who is well over six feet tall, and whose legs had been cramped by the confines of the canoe, responded to the open space by running through the knee deep grass. The meadow was laid out in spacious campsites, some of which showed signs of recent use. We walked to the end of the meadow, and some trails were marked leading into the hardwood forest. A clear brook ran down the hillside, and on its banks, wildflowers grew. I had been planning to make the river trip a two-day affair at some time in the future, camping overnight on the river banks, and here the State Parks people had provided me with a perfect spot.

Then it was time to go. We had five more miles of river between us and Lillington, our getting out point. The last stretch of the river is very calm, compared to the upper reaches. By now, the velocity of the flow is considerably lower, and we passed out of the fall line. The high, rock cliffs on the south bank gradually gave way to gently sloping wooded banks. We passed several fishermen, and the signs of civilization were becoming more apparent. We came around the bend in the river, and saw the bridges at Lillington. Ths trip was over.

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Wildlife

IN NORTH CAROLINA

AUGUST 1977

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Summer's Fragrance

Of summer's many outdoor delights, those found in or near ponds and lakes seem the freshest. The white water-lily adds its special fragrance and beauty to the August scene.

Photo by F. Eugene Hester

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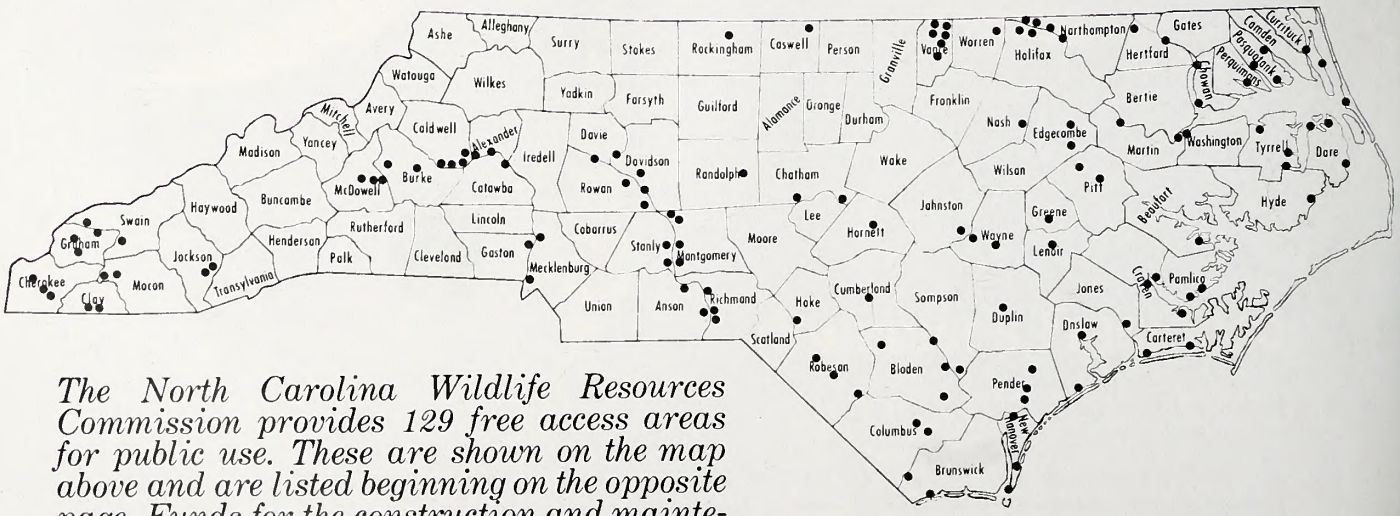
Asheville artist Sallie Middleton (see page 20) has captured a playful mood of a young red fox as it discovers a late summer cecropia moth. When it comes to food, foxes are opportunists, and although they prefer small rodents, large insects often suppliment a lean summer diet. Painting courtesy Foxfire Fine Arts, Inc., Charlotte, N.C.

Need A Place to Launch?

by Ed Jenkins



The North Carolina Wildlife Resources Commission provides 129 free access areas for public use. These are shown on the map above and are listed beginning on the opposite page. Funds for the construction and maintenance of these areas are provided by boat registration fees and a small portion of the State gasoline tax.

ALLIGATOR RIVER

Dare County (East Lake Ferry)—On the north side of the East Lake bridge.

Tyrrell County (Gum Neck Landing) 20 miles south of Columbia via US 94; SR 1321, 1320, and 1316.

APALACHIA LAKE

Cherokee County — Immediately downstream from Hiwassee Dam on the south side.

BADIN LAKE

Montgomery County (Beaver Dam)—14.5 miles south of Denton on SR 2551.

Montgomery County (Lakemont)—Turn off NC 109 on SR 1156 at Blaine, then on SR 1158 (Lakemont).

BEAR CREEK LAKE

Jackson County—5.1 miles east of Tuckaseigee off NC 281 on SR 1137.

BIG FLATTY CREEK

Pasquotank County—From NC 168 at Weeksville, take SR 1103 to 1104 to 1108, approximately six miles from Weeksville.

BIG SWAMP CREEK

Robeson County (Lennon's Bridge)—On SR 1002, 0.3 mile from Columbus County line.

BLACK RIVER

Bladen County (Hunt's Bluff)—Eight miles east of Kelly south of NC 53 on SR 1547.

Sampson County (Ivanhoe) — Just south of Ivanhoe on SR 1100.

BLEWETT FALLS LAKE

Anson County (Pee Dee)—Two miles north of Pee Dee River Bridge (US 74) via SR 1748 and 1747.

Richmond County (Grassy Island)—Five miles west of Ellerbe on SR 1148.

More Access Areas Follow

BOGUE SOUND
Carteret County (Morehead City)—On the east side of US 70 near the western town limits of Morehead City.

BRICE'S CREEK
Craven County—In Croatan National Forest on Forest Service continuation of SR 1143.

CAPE FEAR RIVER
Bladen County (Elwell's Ferry)—Two miles northeast of Carvers at Elwell's Ferry via SR 1730.

Bladen County (Tarheel)—One mile northeast of NC 87 on SR 1316.

Chatham County (Avent's Ferry Bridge)—Two miles southwest of Corinth via NC 42 at Avent's Ferry Bridge.

Cumberland County (Fayetteville)—Four miles south of Fayetteville on NC 87.

Harnett County (Lillington)—Three miles east of Lillington via SR 2016.

CAPE FEAR RIVER BASIN
New Hanover County (Federal Point)—Located at the terminus of US Highway 421 in New Hanover County near Fort Fisher.

CEDAR CLIFF LAKE
Jackson County—From NC 107 at Tuckaseigee, take SR 1135 east to area.

CHATUGE LAKE
Clay County (Jackrabbit)—From US 64, four miles east of Hayesville, take SR 1154 two and one-half miles south to SR 1155, then 1.2 miles to area.

Clay County (Ledford's Chapel)—Five miles east of Hayesville via US 64 and SR 1151.

CHEOAH LAKE
Graham County—Adjacent to NC 28.

CHOWAN RIVER
Chowan County (Cannon's Ferry)—13 miles north of Edenton on NC 32, turn left on SR 1231. Go one mile to area.

Chowan County (Edenhouse Bridge)—Adjacent to US 17.

Hertford County (Tunis)—From NC 45 at Cofield, take 1403 to 1400 to 1402, then 1402, 0.8 mile to area.

CONABY CREEK
Washington County (Conaby Creek)—On NC 45 approximately three miles north of US 64.

CONTENTNEA CREEK
Greene County (Snow Hill)—At Snow Hill, one block east of US 258.

CURRITUCK SOUND
Currituck County (Poplar Branch)—At end of NC 3, 0.7 mile off US 158 north of Grandy.

DAN RIVER
Caswell County (Milton)—Just northwest of Milton on NC 62.
Rockingham County (Leaksville)—NC 14, one mile from Leaksville.

DAWSON CREEK
Pamlico County (Dawson Creek)—Off SR 1302, four miles southwest of Oriental.

DEEP RIVER
Moore County (Carbonton) — Just south of Carbonton on SR 1621.
Randolph County (Sandy Creek)—One-half mile west of Ramseur on US 64.

EAST LAKE
Dare County (Mashoes)—Three miles north of Manns Harbor on SR 1113.

FONTANA LAKE
Graham County (Cable Cove)—About five miles east of Fontana Village on NC 28 to the U.S. Forest Service Cable Cove campground.

Swain County (Tsali)—From NC 28 at Graham-Swain County line, take Forest Service Road north to area.

FRYING PAN LAKE
Tyrrell County (Frying Pan)—Near the end of SR 1307, twelve and one-half miles southeast of Columbia.

GASTON LAKE
Halifax County (Summit)—East of Littleton, one mile north of US 158 on SR 1458.

Northampton County (Henrico)—From NC 46 on SR 1214, 6.5 miles west to area.

Warren County (Stonehouse Creek)—Three and one-half miles north of Littleton on SR 1357.

HANCOCK CREEK
Craven County—From Havelock go east on NC 101, 3.5 miles, then 2.2 miles on SR 1717.

HICKORY LAKE
Alexander County (Steel Bridge)—Two miles north of Hickory on NC 127 to SR 1208, to SR 1141 to area.

Caldwell County (Gunpowder)—On US 321 N, 0.4 mile north of Catawba River Bridge, turn east on Grace Chapel Road (SR 1758), 3 miles to SR 1757, turn north 1.3 miles to area.

Caldwell County (Lovelady)—On US 321 N, 0.4 mile north of Catawba River Bridge, turn east on Grace Chapel Road (SR 1758), 3 miles to SR 1757, turn south 0.9 mile to area.

Catawba County (Oxford)—Southwest of Oxford Dam via NC 16 and SR 1453 to Lake Hickory Camp Ground Road, 1.2 miles to area.

HIGH ROCK LAKE
Davidson County (Southmont)—Off SR 1100, one mile south of Southmont.

Rowan County (Dutch Second Creek)—Eight miles southwest of Salisbury at Bringle's Ferry Road Bridge (SR 1002).

HIWASSEE LAKE
Cherokee County (Grape Creek)—Five miles northwest of Murphy on Joe Brown Highway (SR 1326).

Cherokee County (Hanging Dog)—From Murphy, take SR 1326 approximately three miles northwest to area.

INTRACOASTAL WATERWAY
Brunswick County (Ocean Isle)—On NC 904 five miles south of Shallotte.

Carteret County (Cedar Point)—One mile north of Swansboro on NC 24.
Currituck County (Coinjock)—One mile east of Coinjock on SR 1142.

New Hanover County (Snow's Cut)—Near Carolina Beach, one mile east of US 421 at the south end of the bridge.

Onslow County (Turkey Creek)—From Folkstone on US 17, turn east on SR 1518, approximately three miles to SR 1529, turn south on SR 1529, approximately two miles to SR 1530, proceed south on SR 1530 approximately one mile to area.

JAMES LAKE
Burke County (Canal Bridge)—Two miles northwest of Bridgewater on NC 126.

Burke County (Linville River)—One mile east of Linville River Bridge on NC 126.

McDowell County (Hidden Cove)—On NC 126 approximately one-half mile south of the Catawba Spillway.

McDowell County (North Fork)—One-half mile south of US 221-70 intersection west of Marion via SR 1501 and 1552.

KERR LAKE
Vance County (Bullocksville)—Three and one-half miles west of Drewry on SR 1366.

Vance County (Henderson Point)—Two miles north of Townsville on NC 39 to SR 1356, 2.5 miles to SR 1359, 1.4 miles to area.

Vance County (Hibernia)—1.2 miles north of Townsville on NC 39 to SR 1347, 2.1 miles to area.

Vance County (Satterwhite Point)—Approximately five miles north of I-85 at the end of SR 1319.

Vance County (Williamsboro Wayside)—Five and one-half miles north of I-85 in Henderson on NC 39.

Warren County (County Line)—Three miles north of Drewry on SR 1200 to SR 1202, thence three-fourth mile to SR 1361, thence 1.2 miles to SR 1242, thence one-half mile to area.

Warren County (Kimball Point)—Five miles north of Drewry on SR 1200 to SR 1204 one and one-half miles to area.

KITTY HAWK BAY
Dare County (Avalon Beach)—At Avalon Beach, one-half mile west of US 158.

LITTLE RIVER
Pasquotank County (Hall's Creek)—Between Nixonton and US 17 on SR 1140.

LOOKOUT SHOALS LAKE
Catawba County—Near Lookout Dam, six miles northeast of Conover on SR 1006 off NC 16.

LUMBER RIVER

Hoke County (Wagram)—On US 401 approximately one mile northeast of Wagram.

Robeson County (High Hill)—At south edge of Lumberton on US 74 (Business) at Lumber River Bridge.

Robeson County (McNeil's Bridge)—From US 301 Bypass, take NC 72 northwest to area (within sight of US 301).

MEHERRIN RIVER

Hertford County (Murfreesboro)—North side of bridge on US 258 at Murfreesboro.

MOUNTAIN ISLAND LAKE

Gaston County (River Bend) — Twelve miles northwest of Charlotte on NC 16.

Mecklenburg County (Davidson Creek)—Northwest of Charlotte, 12 miles on SR 2074 (Beatties Ford), turn left on SR 2165.

NANTAHALA LAKE

Macon County (Choga Creek)—East of Andrews via SR 1505 and U. S. Forest Service Road No. 30.

Macon County (Rocky Branch)—Nineteen miles west of Franklin via US 64 and SR 1310.

NEUSE RIVER

Craven County (Bridgeton)—One mile north of Bridgeton just off US 17.

Johnston County (Richardson's Bridge)—Off SR 1201, approximately nine miles southeast of Smithfield.

Lenoir County (Kinston)—On US 70 W in Kinston adjacent to the Neuse River Bridge.

Wayne County (Goldsboro) — Adjacent to US 117 south of Goldsboro.

Wayne County (Cox's Ferry)—On Wayne County Road 1224 approximately nine miles west of Goldsboro.

NEW RIVER

Onslow County (Jacksonville)—Adjacent to the US 17 New River Bridge in Jacksonville.

NORTHEAST CAPE FEAR RIVER

Duplin County (Kenansville)—Between Kenansville and Beulaville on NC 24.

New Hanover County (Castle Hayne)—Adjacent to the US Highway 117 bridge over the Northeast Cape Fear River.

Pender County (Holly Shelter)—At Holly Shelter Refuge, six miles south of NC 53 via SR 1523 and 1520.

Pender County (Sawpit Landing)—On NC 53, three miles north of Burgaw, turn on SR 1512. Area located at the end of SR 1512.

PAMLICO RIVER

Beaufort County (Smith's Creek)—In Goose Creek Game Land area on NC 33 approximately two miles west of Hobucken.

PAMLICO SOUND

Dare County (Stumpy Point)—Located at the end of SR 1100.

Hyde County (Engelhard)—East of US 264 at north town limits of Engelhard.

PASQUOTANK RIVER

Pasquotank County (Elizabeth City)—From Elizabeth City, take US 17 north to Knobb Creek Road approximately one-half mile to area.

PEE DEE RIVER

Anson County (Red Hill)—Eight miles north of Wadesboro on NC 109.

Richmond County (Blewett)—From Rockingham, approximately four miles west on US 74 to SR 1140, one mile to SR 1141, approximately 3.5 miles to area.

Richmond County (Rockingham)—On US 74 approximately six miles west of Rockingham.

PERQUIMANS RIVER

Perquimans County (Perquimans)—From Hertford, east on SR 1300, approximately nine miles to SR 1319, thence one mile to area.

RHODHISS LAKE

Burke County (John's River)—3.8 miles north of Morganton on NC 18.

Caldwell County (Castle Bridge)—North of Connelly Springs at Castle Bridge via SR 1001.

Caldwell County (Dry Pond)—One mile southwest of Granite Falls.

ROANOKE RAPIDS LAKE

Halifax County (Thelma)—Two miles northeast of Thelma via SR 1400 and 1422.

Northampton County (Vultare)—Take NC 46 to Vultare, then south to SR 1213. Area located at end of SR 1213.

ROANOKE RIVER

Halifax County (Weldon)—On US 301 at Weldon.

Martin County (Hamilton)—In town limits of Hamilton.

Northampton County (Gaston)—At northwest end of NC 48 bridge north of Roanoke Rapids.

Washington County (Plymouth)—Adjacent to Highway 45 Bridge east of Plymouth.

SANTEETLAH LAKE

Graham County (Avey Creek) — Eleven miles west of Robbinsville. Turn left on Forest Service Road approximately five miles to area.

Graham County (Ranger Station)—Five miles west of Robbinsville on SR 1127.

SCUPPERNONG RIVER

Tyrrell County (Columbia)—One mile west of Columbia off US 64.

SHELTER CREEK

Pender County—Nine miles east of Burgaw, one-quarter mile off NC 53, on SR 1523.

SMITH'S CREEK

Pamlico County (Oriental)—At the end of Midgette Street in the town limits on the west side of NC 55 bridge.

SOUTH RIVER

Bladen County (Ennis Bridge)—From NC 210, five miles south of NC 41, take SR 1007 one mile east to area.

Bladen County (Sloan's Bridge)—Two miles southwest of Garland on US 701.

SOUTH YADKIN RIVER

Davie County (Cooleemee) — Two miles northwest of Cooleemee on SR 1116 (Davie Academy Road).

TAR RIVER

Edgecombe County (Bell's Bridge)—One mile north of Tarboro on NC 44 at Bell's Bridge.

Edgecombe County (Old Sparta)—On NC 42 at Old Sparta.

Nash County (Rocky Mount)—Adjacent to Business US 301.

Pitt County (Falkland)—On SR 1400, off NC 43, one mile east of Falkland.

Pitt County (Greenville)—Off NC 33 approximately one mile east of the city limits of Greenville, turn north on SR 1533, approximately one-half mile to area.

TILLERY LAKE

Montgomery County (Lilly's Bridge)—Five miles west of Mt. Gilead. Take NC 731, turn right on SR 1110.

Montgomery County (Swift Island)—Five miles southeast of Albemarle on NC 27-73.

Stanly County (Norwood) — From Norwood take SR 1740 approximately one mile to area.

Stanly County (Stony Mountain)—From Albemarle, east on NC 24, 27, 73 approximately five miles to the Lighthouse Marina Road, site is adjacent to marina.

TUCKERTOWN LAKE

Davidson County (High Rock)—On Davidson County Road 1002 approximately four miles west of Healing Springs.

Rowan County (Flat Creek)—On SR 2148, three miles north of NC 49 via SR 2152.

WACCAMAW LAKE

Columbus County—On Lake Shore Road west of NC 214.

Columbus County (Big Creek) — Northeast shore of Lake Waccamaw on SR 1947.

WACCAMAW RIVER

Brunswick County (Waccamaw River)—Adjacent to the NC 904 Highway Bridge across the Waccamaw River in Brunswick County.

WHITE OAK RIVER

Jones County (Haywood's Landing)—Five miles southeast of Maysville, south of NC 58.

WYLIE LAKE

Mecklenburg County (Copperhead)—Shopton Road to Pine Harbor Road to SR 1333, one mile to area.

YADKIN RIVER

Davie County (Concord Church)—From Fork, on US 64, west four miles on NC 801 to access road leading southeast one-half mile to area.

SHOTSHELL RELOADING- *The Better Alternative*

By Gary E. Stevenson

These are the basic items of the author's reloading equipment. The article tells you what to buy and about what you'll have to pay for it.

It won't be long before dove season rolls around again, and we'll see throngs of optimistic hunters lining up in their favorite sporting goods emporium for a supply of shells. Many of them will shake their heads and mutter unkind remarks about shell manufacturers and inflation in general when they see that ammo has gone up again. Each year I hear more and more hunters complaining about the spiralling price of ammunition. Many hunters would like to get in more practice before and during the season, but are precluded from doing so by high ammo prices. Buying shells by the case or at wholesale will yield some savings, but the best and most inexpensive alternative is to reload those empty hulls you used to throw away.

Look at the accompanying table. A quality 12-gauge light field/target load will retail for around $5.00 per box, and a budget-priced shell will ring in at about $3.75 per box. The $5.00 shells can be handloaded to the same specifications for less than $2.00- almost 50 percent less than the price of the budget shell! These prices are approximate retail value. Some dealers offer discounts on their factory ammo, but discounts can also be found on reloading components (powder, primers, shot, and wads).

Cost is a major point in favor of reloading. Another is versatility. Several good shotshell reloading manuals are available which list a large variety of powder-wad-shot combinations in the standard loadings, and quite a few useful loads not available from the factory. For example, several low-velocity, heavy shot charge loadings are listed in different manuals and are useful in a variety of situations where high pellet velocity is not needed. If you want a heavy shot charge from the factory you get the high velocity (and higher recoil) whether you want it or not.

The reloader really comes into his own at the higher-power end of the shotshell spectrum. the 2-3/4 inch, 12-gauge magnum load now retails at $8.70 a box. The handloader can have these same shells at around $2.65 a box- a 70 percent savings- and using special components available he can often improve his pattern and range over equivalent factory shells. Savings for other gauges are equally as impressive.

Handloads are just as reliable as factory ammunition, provided a good plastic shell case is used. Paper or cheap plastic cases are usable, but reliability and consistency may fall off somewhat, particularly in damp weather.

Perhaps the greatest concern of the prospective handloader is safety. The main ingredient in a safe, reliable reload is a good dose of plain common sense. Loading components are considerably safer to store than gasoline or lighter fluid. Modern smokeless powder is classified as a propellant, not as an explosive. It releases large amounts of gases and heat on ignition, but it doesn't explode in the definitive sense of the word. Properly stored in the factory containers, powder and primers are safe and last indefinitely.

O.K., if you've read this far you've probably interested. What does it take to get started in handloading shotshells?

First of all, don't be scared off by the mountains of technical material you may encounter. The terms may sound complicated, but if you just follow the instructions given with your equipment and loading manual, you won't go wrong. The lingo will come naturally as you learn.

Quality loading presses are made by several companies in just about every price range from $10 to over $400. The cheap equipment will make a usable shell, but it's abominably slow- about 25 to 50 rounds per hour. You have to have the patience of a rock to use one. The most expense rigs will turn out a shell every 10 seconds, but most of us simply don't need that much production potential. The presses in the $40-80 price range are the most popular, turning out a box of shells in about 15 minutes. Good presses last practically foreever- I've been using my MEC "600 Jr." for over 10 years, and the only thing I've had to replace is a 49¢ guide finger.

Be sure to inspect and sort all your empty cases according to brand interior dimensions. Lyman's *Shotshell Handbook* has color illustrations and dimensions listed for all major brands of shells and is quite helpful in this regard. Check to see that the shell is structurally sound- no split brass or case mouths, no broken base wads, etc. Many major manufacturers now offer a budget-priced shell in their line, such as Winchester's "Dove and Quail Load" or Remington's "Mohawk" brand. These shells work fine from the factory but are not as strong as the more expensive shells- they are notorious for breaking their base wads on firing, making them a poor choice for reloading. The best cases for the purpose are the one-piece, compression-formed plastic shells offered by Winchester Remington, and a few others. These will last considerably longer (up to 10-20 reloadings) and are worth the extra initial price.

There are only four basic steps to reloading shotshells, although different presses may use different layouts to accomplish them. These are resizing, repriming, charging the shell with powder and shot, and crimping the shell closed.

When a shotgun shell is fired the escaping powder gases force the case mouth and walls tightly against the chamber walls, effectively preventing gases from escaping to the rear. The case walls spring back toward their original dimensions after firing; the resizing step ensures that a new wad column will enter the case easily and that the brass base will chamber in your gun. Some reloaders who shoot double barrel or single shot weapons skip the resizing step. These guns will shoot just about any shell of the proper gauge which can be crammed into the chamber, although extracting the shell after firing may present somewhat of a challenge. Resizing is a must for auto-loading or pump-action weapons.

In the repriming step the fired primer is punched from the case and a new one seated. There are two different sizes of primers for shotshells; make sure you have the proper one for the case you are loading.

In charging the shell, a measured amount of powder is dropped into a primed case, a wad column is seated on the powder, and the proper amount of shot is dropped in last. There are many different types of powder for different power ranges- consult a loading manual to find the one which best suits your needs. Wads also come in a variety of sizes to accommodate various amounts of shot and case sizes. Shot is available in all popular sizes and comes in 25-pound bags. All but the most inexpensive presses are equipped with metering devices which can be adapted to measure out correct amounts of powder and shot.

The crimping operation folds the shell closed. The round is now ready for firing. Special crimping set-ups are available for rifled slug or buckshot loads which use a rolled crimp rather than the familiar folded crimp.

Loading manuals will list several precautions, most of which are common sense. Keep different kinds of powder in their original containers, and don't use powders whose identity you aren't sure of. Many of them have similar appearances, but their burning characteristics may be very different. And for Heaven's sake DON'T try and "cook up" your own load. Several years ago a fellow developed his own load using a double charge of a popular powder. "Used it for years," he said. Well, everybody at the skeet range ran off and hid the first time he pulled the trigger. There was a big orange flash, a deafening roar, and the adjustable choke device on his barrel sailed about 50 yards downrange. Stick to recommended loads.

A word is in order concerning steel shot. The lead poisoning of our waterfowl has reached severe levels, and federal regulations have required the use of steel shot for waterfowl hunting in some areas. It appears likely that the steel-shot restriction will spread in coming years. At this time reloading data are not available for steel shot, and component manufacturers warn against substituting steel shot for load. New data will certainly appear in the future, but for the time being we'll have to stay with lead shot for reloads.

Reloading equipment dealers are happy to answer any questions about how to get started. Experienced reloaders will squabble like a bunch of banty roosters about favorite loads and what makes them "best," but they are always happy to help beginners.

One word of warning- the amount of money you save by reloading your own ammunition may look impressive on paper, but it doesn't always work out that way. The reason is that, although you may save 2/3 the cost of factory shells, you'll probably shoot three times as much in practice. But then you'll be a better shot- and that alone makes it all worthwhile.

		3-inch MAGNUM	2 3/4-inch MAGNUM	EXPRESS	LIGHT FIELD/ TARGET	BUDGET FIELD/ TARGET
		3-inch MAGNUM	2 3/4-inch MAGNUM	EXPRESS	LIGHT FIELD/ TARGET	BUDGET FIELD/ TARGET
12-Gauge	FACTORY	$10.20	$8.70	$6.40	$5.25	$3.75
12-Gauge	RELOAD	2.90	2.65	2.49	2.00	1.75
	SAVE	$ 7.30	$6.05	$3.91	$3.25	$2.00
20-Gauge	FACTORY	$ 7.25	$6.45	$4.95	$4.25	$3.45
20-Gauge	RELOAD	2.55	2.10	2.00	1.60	1.35
	SAVE	$ 4.70	$4.35	$2.95	$2.65	$2.10

Reloading is the best way to save money on shotshells. These prices are based on suggested retail for factory shells and reloading components and will vary from dealer to dealer.

Photo by Jim Page

Mystery surrounds the formation of Jones Lake (above left) and other shallow oval depressions known as the Bay Lakes. Swimming is a popular summertime activity (left) at Jones Lake State Park. Bald cypress can be seen along the shore of Jones Lake (above).

JONES LAKE STATE PARK

By Marcia Constantino

Jones Lake is one of the fascinating "Carolina Bays" whose origin is still a geologic mystery. The Carolina Bays, so called because they were first studied in the Carolinas where they are most abundant and because of the bay trees growing around them, occur in a general northwest-southeast line on the Atlantic Coastal Plain from northern Virginia to southern Georgia. There are thousands of them in North Carolina ranging in size from a few hundred feet to several miles in length; and none of these shallow elliptical depressions is deeper than twelve feet.

Jones Lake State Park covers 2,208 acres adjacent to Bladen Lakes State Forest including Jones Lake and Salter's Lake, another Carolina Bay. The park's recreational activities center aound Jones Lake; Salter's Lake is not now developed for public use. Other well known Bays in the state are Lake Waccamaw, White Lake, Bay Tree Lake, and Singletary Lake.

Even the geologists who study the Bays cannot agree on their origin. According to one theory, all the basins were formed at the same time by a large shower of meteorites striking the earth from the northwest. Another theory proposes that the basins were first dug out by underground springs and then enlarged by wind and wave action over thousands of years. Whatever their origin, nowhere else in the world are similar basins found.

Today, except for a few of the Bay Lakes, the depressions no longer contain water, having gradually filled in with peat. Jones Lake, which covers an area of 224 acres, is now only one-third of its original size.

In the 1730's Jones Lake was known as Woodward's Lake for Samuel Woodward, a local justice of the peace. It was later

named for Isaac Jones, who owned property on the lake.

PUBLIC FACILITIES

Swimming and picnicking are the most popular day uses at Jones Lake State Park. The swimming area is supervised by lifeguards from June 1 through Labor Day, 10:00 a.m. to 6:00 p.m. Swimming fees are $.75, adults; $.50, ages 6-12; free, under six years. A modern bathhouse containing restrooms, showers, and baskets, and a nearby refreshment stand are open during the summer months. Next to the lake, settled among the pines and cypress, are over 50 picnic tables and 35 grills. Several tables are located inside a large covered shelter.

Boating and fishing also attract visitors to Jones Lake. Park-owned rowboats can be rented for $.75 an hour. The park visitor can use his own small motor (under 10 hp) on a rental boat. Private boats are permitted on the lake, and no charge is made for launching facilities. Fishing in season is free at Jones Lake from boat or pier. Because of the lake's high acidity, angling is only fair. Yellow perch and blue-spotted sunfish are the most abundant game fish. There are smaller numbers of chain pickerel ("jack"), bullhead catfish, and lake chubsuckers.

A small campground open all year contains 18 tent/trailer sites for family camping. Each site has a table and grill. There are no water or electric hookups for trailers, but drinking water is available to all campers. the washhouse has hot showers and flush-type toilets. The cost for these sites is $3.50 a day for each family or groups of four individuals. Campers with pets pay an additional $.50 per day for each uncaged animal, which must be kept on a six-foot leash. Reservations for campsites can be made for a minimum of seven days and a maximum of two weeks. Unreserved campsites are assigned on a first-come basis.

HIKING AND NATURE STUDY

A hiking trail around Jones Lake enables visitors to enjoy that special environment typical of the Bay Lakes. This self-guided trail makes a 2.8-mile loop of the lake with side trails to the lakefront. Park rangers lead trail hikes on request, identifying plant and animal life and interpreting the park environment to visitors.

Bays, pines, gums, cypress, and dogwood are the most prominent trees in the park. The loblolly bay, a member of the tea family, has been called the most beautiful small tree in North Carolina. Glossy, evergreen leaves shield large, white, fragrant blossoms. The red bay is a small evergreen in the laurel family. Its leaves give off the scent of bay rum. Best known as a shrub bog plant, the sweet bay can be recognized by large showy leaves with blue-gray undersides. Large, highly scented flowers identify this plant's relationship to the magnolia. Growing among other bays is the bull bay, a white-flowered shrub.

Crooked trunks and short stocky cones mark the pond pines growing close to the lake. They can live up to 60 years in the drenched soil of the bogs. The majestic longleaf pine, once exploited for its turpentine-producing resin, produces cones only every three to seven years. Rows of baldcypress laden with Spanish moss line the shore, their swollen bases protruding above the water. A few cypress trees grow farther out in the lake.

Two interesting trees are black ti-ti and gallberry. Black ti-ti, or leatherwood, lends color to the landscape. A small tree bearing tiny white blooms, it has smooth, light-colored bark covering hard, compact wood. The gallberry tree grows in the dry part of the shrub bog. Nectar glands in its flowers make it a valuable honey plant. Its black berry is a source of quinine. A less common upland forest tree is the white cedar, also called the juniper.

Low growing plants are represented by American holly, wax myrtle, and fetterbush, which nestle in hollows around the camping area, while the wild blueberry grows in profusion throughout the park.

WILDLIFE

Jones Lake State Park is home for at least two endangered animal species—the pine barrens tree frog and the red-cockaded woodpecker. The pine barrens treefrog, green with a prominent lavender stripe bordered by white on each side, is among the most striking of North American frogs. This species occurs in shrub bogs among dense growths of pine and bay trees. It is rarely seen, but on warm, rainy summer evenings the loud repeated "quaak, quaak, quaak" of the pine barrens treefrog can be heard resounding over the forest.

The red-cockaded woodpecker has been recorded in small numbers at the park. It is the only woodpecker that requires living, mature pine trees for nesting. The bird drills into the trunk and builds its nest inside. The telltale white sap which collects around the hole declares the woodpecker's presence. A handsome bird, it is around seven inches long from tail to beak, with black and white horizontal stripes on its back and large white cheek patches. The red-cockaded woodpecker derives its name from the male bird, which has small red markings, or cockades, behind each eye.

Animals native to the area and to North Caorlina in general are plentiful throughout the park. Common mammals include gray fox, raccoon, opossum, gray squirrel, white-tailed deer, fox squirrel, bobcat and black bear. Among permanent bird residents are the wild turkey, red wing blackbird, owls, hawks, and numerous songbirds including the parula warbler.

STATE LAKES MASTER PLAN

A State Lakes master plan for six of the "Bays" is being prepared by the N.C. Division of Parks and Recreation. The lakes involved are White, Bay Tree, Singletary, Jones, Salter's and Bushy Lakes. The master plan has not been finalized, so facilities and services described are still under consideration at the time of this printing.

To provide an overall balance of use, facilities proposed at one lake will be closely related to facilities at the other lakes. White Lake, because of its central location and high population base, forms the nucleus of the plan. A visitor center, which would orient visitors to the bay lakes region, is being considered. In addition, two alternative park proposals are being considered for White Lake. The first alternative calls for a state recreation area with day facilities only; the second alternative proposes a community park with more intensive-use facilities such as tennis courts and play fields.

The master plan suggests an interpretive center to promote visitor understanding and appreciation of the region's natural resources. It could be constructed betweel Salter's and Jones Lake and be accessible from N.C. 242. Indoor displays and audio-visual techniques would describe the natural processes and theories of origin of the Carolina Bays. It is anticipated that the N.C. Division of Forest Resources would participate in the interpretive center program with information on state forest history, management, and operations.

Under the proposed master plan, Bay Tree Lake is to be developed as a state recreation area with facilities for picnicking, boating, swimming, hiking, and camping. Jones Lake would remain a state park with expansion of existing facilities. Singletary Lake would continue to operate as an organized group area but with expanded facilities to accommodate several groups at once. Salter's and Bushy Lakes would be maintained as natural areas. Hiking trails, primitive camping, and non-motorized boating are proposed for Salter's Lake; trails, a boardwalk, and a observation platform for Bushy Lake.

For more information about Jones Lake State Park and other parks in the N.C. State Park System write: Division of Parks and Recreation, N.C. Department of Natural Resources and Community Development, P.O. Box 27687, Raleigh, N.C. 27611.

Flying Dragons

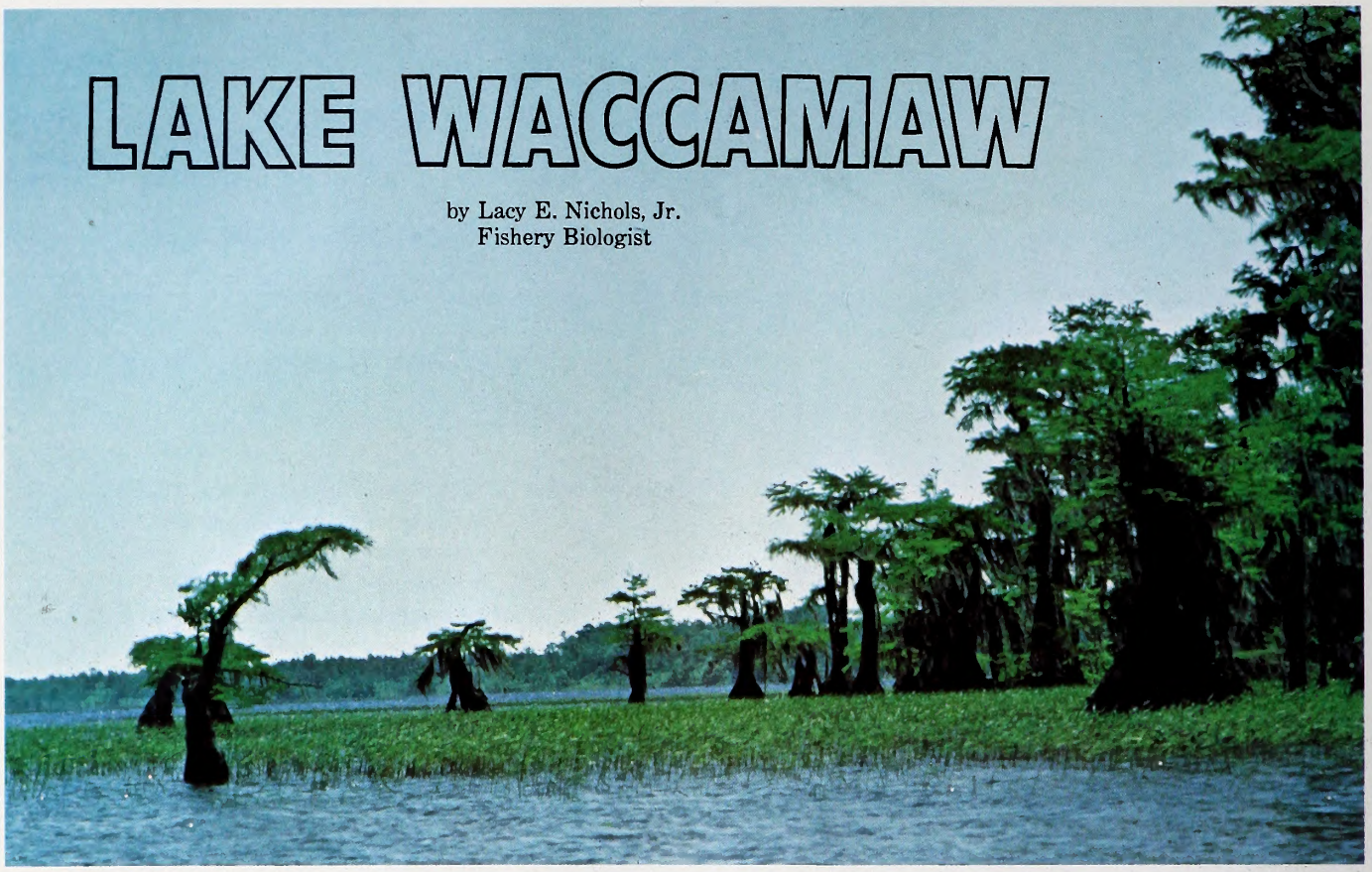
Photos by Chris Marsh

The dragonflies and their close relatives, the damsel flies (bottom right) form a fascinating group of aquatic insects. Although the nymphs of some species may catch and eat tiny fish, these insects are considered quite beneficial as adults since they eat large quantities of flying insects. Dragonflies are completely harmless to man although large ones may nip a finger if roughly handled.

Both the aquatic larvae and adults are eaten by many kinds of fish.

LAKE WACCAMAW

by Lacy E. Nichols, Jr.
Fishery Biologist



Photos by Ted Dossett

Geomorphologists place the age of Lake Waccamaw between 250,000-500,000 years. However, to you the fisherman, this is of little importance. Your primary objective is to wet a line and take home a good catch. This is the objective of this article, to help you catch more fish and provide you with more hours of productive fishing pleasure. First, a few general points of interest. This state-owned lake covers 8,936 acres. Some important physical features of the lake include a maximum depth of 10.8 feet with an average depth of 7 feet, and shoreline approximately 14 miles in length.

Lake Waccamaw is within an easy drive of Wilmington, Fayetteville, Raleigh, and Charlotte, by the following routes: East-West US 74-76 and North-South US 701. Light aircraft facilities are available near Whiteville, North Carolina.

Boat launching facilities are present on each side of the lake. Two free public access ramps are provided by the Wildlife Resources Commission. One private ramp is located on Lake Waccamaw. Overnight lodging accommodations are available at the lake and nearby Whiteville. Camping facilities are available around the lake for tents, trailers, or motor-home, but private property should be respected.

Gasoline and oil are available at two commercial piers located on the lake. One facility is on the western side of the lake and the other is on the northeastern side. Each of these piers has supplies of bait and tackle.

Restrictions and regulations on Lake Waccamaw are those applicable to other North Carolina waters. These regulations are listed in the Motorboat Regulations and Inland Fishing Regulations published by the Wildlife Resources Commission.

Thirty-six different species of fish have been found in Lake Waccamaw. Typical game fishes in the lake are largemouth bass, white perch, shellcracker, bluegill, crappie, yellow perch, pumpkinseed and warmouth.

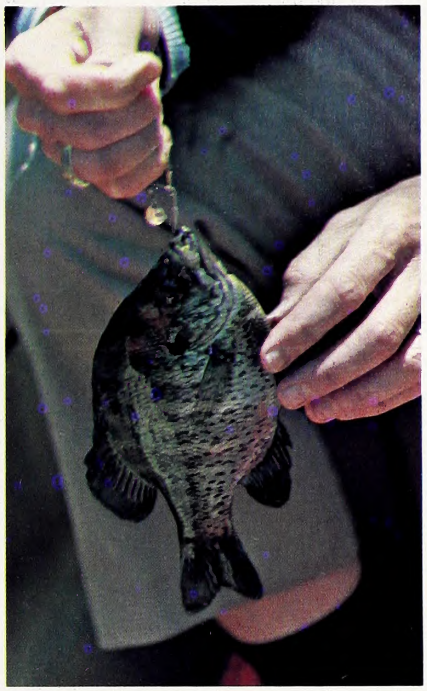
Longnose gar, white catfish, flat bullhead, yellow bullhead, carp, gizzard shad, eastern lake chubsucker and bowfin are representative nongame fishes present in Lake Waccamaw.

Table 1. indicates the various game fishes, types of artificial lures or natural baits, the best location in Lake Waccamaw and the most productive times of the year to fish. The available information on unofficial record catches in Lake Waccamaw as well as official state-wide records for selected species also are included.

Information for the newcomer to Lake Waccamaw is provided in a reference map showing the three most productive fishing areas (Figure 2). Area 1 is located on the north side and is accessible by boat from the Big Creek access ara. Excellent catches of largemouth bass and crappie are taken from this area following periods of heavy rains. The largemouth and crappie apparently are attracted to the area by the increased flow from the four creeks and the various food items brought into the lake. March and April are two highly productive months for this area. Live minnows are the most productive natural bait for these species. Bank fishing is also available along some of Big Creek.

Area 2, located from the canal entrance into the lake to the mouth of the Waccamaw River on the western side also provides good crappie fishing using natural bait during March and April. The aquatic weed beds on the southwestern edge offer the wading enthusiast excellent shellcracker fishing during the spawning period. April and May have been the most productive months. The most successful bait has proven to be red worms and occasionally live minnows. Wading around the weed beds is the best method for taking shellcracker. The less movement you make, the better.

Pumpkinseed can also be taken in this same area from April through August by using both artificial and natural baits. Several fish attractors are situated around the "Slow No Wake" pilings on the western lake edge. Each fish attractor is marked with the following sign "Fish Hide Area." As with most fishing, the best



A great deal of Waccamaw's south shore is still fairly wild and undisturbed (opposite page). "Fish hides" constructed of bunches of old automobile tires sunk in six to ten feet of water, often provide some of the best fishing (left). Bluegills (above), other panfish and bass form most of the catch.

time varies according to water temperatures; however, January through March is a good time to fish this area.

Bluegill are taken from the entire lake using artificial and natural baits. Cove areas, piers, and weed beds in deeper water generally produce good results. The most productive time is from late May through August when bluegill are spawning.

White perch can generally be taken throughout the year, drifting or trolling in six feet or more of water using artificial or natural baits. Best results occur when the water has a slight wave action from the wind.

Fliers, warmouth, bowfin and redfin pickerel occasionally are taken from Big Creek. Chain pickerel can be taken from the entire lake using small spinners and natural bait. Redbreast sunfish are caught using worms and crickets below the dam throughout the summer from May through August during normal water levels.

Lake Waccamaw is the most productive of any bay lake in southeastern North Carolina. This icnreased productivity can be attributed to an extensive marl deposit located on the northeastern side of the lake. Lake Waccamaw has a pH value of 6.8 and an alkalinity value of 20.0 ppm.

Over 70 percent of the bottom is clean sand, free of any organic material. This area of clean sand is also located along the margin of the lake. Only the central

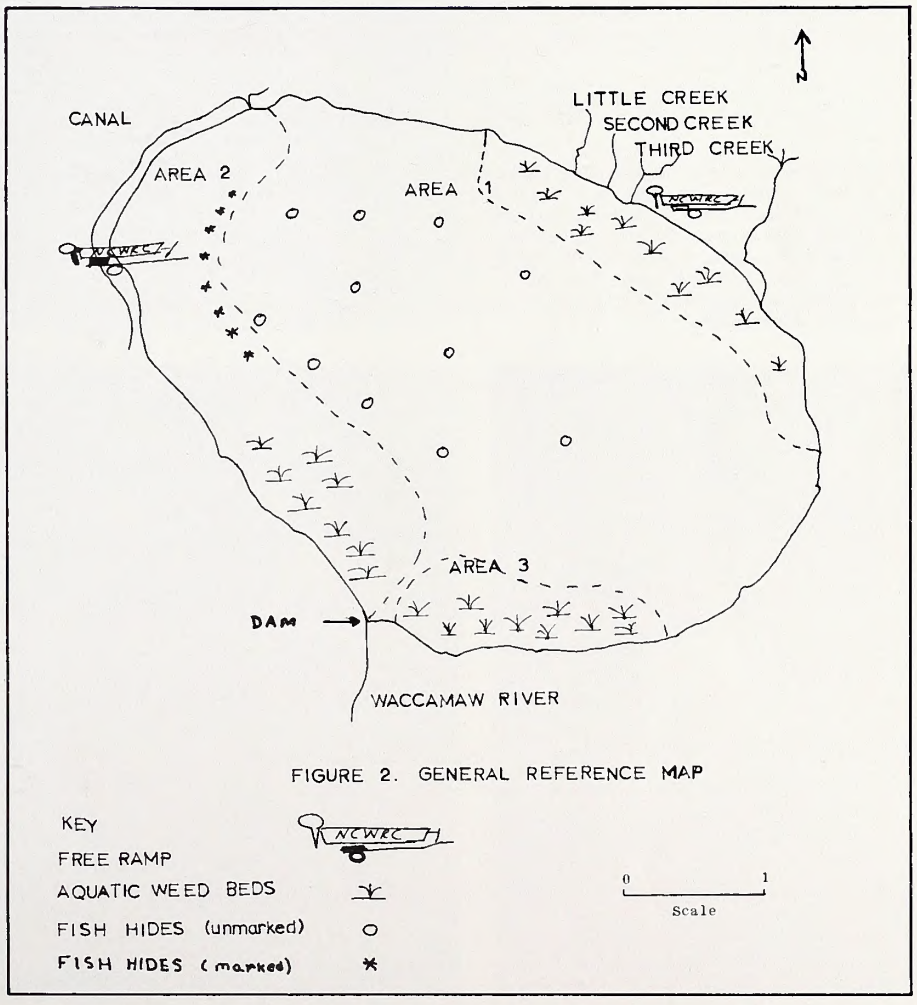


FIGURE 2. GENERAL REFERENCE MAP

portion of the lake bottom has any organic material. This 30 percent of the bottom is composed of fibrous and pulpy peat deposits overlying the sand. A shifting unstable substrate such as sand prohibits accumulation of organic material capable of providing food to smaller aquatic organisms.

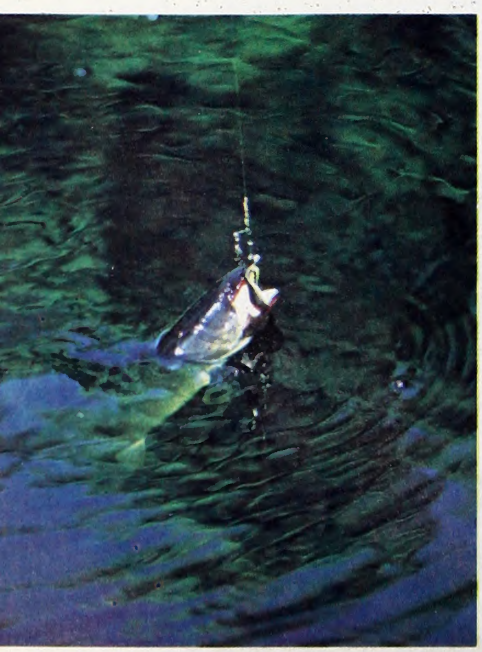
Available cover is limited within Lake Waccamaw. The predominant form of cover is the emergent aquatic weed beds present around the lake edge. Six dominant aquatic plants providing cover in Lake Waccamaw are maiden cane, yellow water lily, American lotus, pickerel weed, bald cypress and cattail.

Fish management efforts by the Wildlife Resources Commission have been concentrated in stocking the following fishes: largemouth bass, bluegill, shellcracker, and redbreast sunfish. Threadfin shad were stocked in an effort to introduce another suitable forage fish into Lake Waccamaw. The introduction of tire shelters to create additional cover has proven very effective in concentrating fish. These shelters provide areas for escape and additional substrate where aquatic organisms can attach and thus fishes are attracted to the shelter in search of the cover and food. Future plans for continued improvement of fishing in Waccamaw include: (1) Placement and marking of additional tire shelters, and (2) Continued research for another suitable forage fish.

TABLE 1. FISHING FACTS FOR LAKE WACCAMAW.

SPECIES	ARTIFICIAL	NATURAL	BEST	BEST	UNOFFICIAL	OFFICIAL
Species	Artificial Lures	Natural Bait	Best Location	Best Time	Unofficial Lake Waccamaw Record	Official Statewide Record
Largemouth bass	Rappala Rebel Mepps Comet spinners plastic worms	Shiners	Near inlets, canal, trolling lake proper and aquatic weed beds	February through July	8.5 lb. Average 1.5-4.0 lb.	14.5 lb.
White perch	Mepps Comet Rappala Rebel spinners	Minnows Small shiners	Drifting, trolling the entire lake where water is six feet or deeper	Year-round. Best when water has slight choppy action	2.2 lb.	None
Yellow perch		Minnows Shiners Red Worms	Six feet or more of water, Above spillway at dam and inside weed beds	January through March	1.2 lb.	None
Shellcracker		Red Worms	Wading in two feet of water or less around weed beds	When actively spawning. April and May	3.1 lb.	4.2 lb.
Crappie	Bucktails Doll flies spinners	Minnow Shiners	Drainage canals and around piers	February through April depending on water temperature	3 lb. Average 1.5-2.0 lb.	4.5 lb.
Bluegill	Glo popper with legs dry flies	Red Worms Minnows Shiners	Entire lake	May through August while on bed	0.75 lb.	4.3 lb.
Pumpkinseed	Glo popper with legs	Red Worms Minnows Shiners	Weed beds on southwestern side	April through August, best in the late evening	0.75 lb.	None
Warmouth	Yellow popping bug	Red Worms Crayfish	Drainage canals	May through September	0.5 lb.	None

The black water creeks feeding Waccamaw have their share of grindle or blackfish (below) which often hit artificial lures used for bass and other game fish. This small boat is typical of the craft used to fish the weed beds scattered along the south shore of the lake. Watch out for sudden winds which can churn the shallow lake.



NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Roan Naturalist Rally

An excellent opportunity to see flora and fauna of the mountains shared by North Carolina and Tennessee will be yours September 10 and 11. For information about the Roan Naturalists Rally, write Thomas Gray, Route 8, Box 488, Elizabethton, Tennessee 37643.

Pelican Prints Going Well

Response to the limited edition pelican prints offered in the July issue of WILDLIFE IN NORTH CAROLINA (see page 26) has been good. If you missed the announcement, write "Carolina Conservationist," Wildlife, 325 N. Salisbury Street, Raleigh, NC 27611 for complete information. Last year's print of the red-cockaded woodpecker is still available also.

Combination Licenses Expired

1976-77 Combination Hunting and Fishing Licenses expired July 31. Be sure you have your new one before your next fishing trip.

National Hunting and Fishing Day

September 24 has been set for this important event to be observed nationally. For information on how to set up a "day" in your area write NHF Day, 1075 Post Road, Riverside, Conn. 06878.

First Notice to Artists

Wildlife artists should begin preparing works to be exhibited at the Annual Wildlife Art Exhibit sponsored by the Wake County Wildlife Club early in December. Details will soon be available from exhibit chairman Rex Schmidt, 3700 Trenton Road, Raleigh, N.C. 27607.

Tick with a Fever

By Derry Walker

Grady Buttram stopped his old Plymouth under the bay of Otis Peeler's Gulf, and swung open the door. Otis came out, wiping his hands on a rag, peering at Grady through coke-bottle glasses.

"Gimme 'bout three dollars worth, Otis," Grady said softly.

"Comin' up," Otis said, and Grady heart him clear the pump and clank the nozzle into the pipe. The sounds were strangely distant, as if they were happening across the street, and Grady rubbed his throbbing temples with both hands as he sat sideways in the seat, his feet on the concrete. Otis glanced from the pump to his customer and screwed his face into a familiar squint around his thick glasses.

"You don't look or sound like you feel too good," he drawled, his head tilted back on his long neck.

"Well, I don't 'zactly feel like whuppin' no b'ars," Grady said, still massaging his temples. "Got the worst headache I ever remember in my life." Otis clicked the nozzle into place, replaced the tank lid and walked around to the driver's side.

"Oil and water all right?"

Yeah, it's O.K."

"Man, you look right gray. Get too hot or somethin'?"

"I don't know. Been feelin' like this for a couple of days. Seems like it's gettin' worse all of a sudden, though. I was fishin' and I got to feelin' so bad, I quit and came on in."

Otis screwed his face into another mass of wrinkles which was either a sympathetic expression or a grin.

"You must feel bad to quit fishin'," he said. "Been to Upper Falls Lake again?" Grady nodded, and this slight motion made him dizzy. "You really found where they're bitin' up there, didn't you? Bring any back today?"

"I got a few on a string in the trunk. They were there, but I just didn't feel like it. Put that down, will you, Otis?" Grady asked softly as he pulled the door.

"Right," Otis said. "You better go home and get off your feet a while." Grady nodded, ground the starter and pulled away slowly.

What the devil is wrong with me, he thought as he drove slowly down main street. The headache had become so painful that every sound, sight or action made him wince. As he parked in front of Main Street Drug, a sudden chill ran through him, and the abrupt shaking almost caused him to jump the curb. He entered the drug store and walked slowly toward the prescription counter at the rear. A saleslady spoke to him from behind a display case and he grunted a reply.

Dale Reagan, the pharmacist, was counting tablets for a customer when Grady neared the counter, so he paused and mindlessly examined the first-aid counter. Then he started another series of the hacking coughs he had begun a few days ago. The coughs sent spikes into his aching head, and as they subsided he saw stars and felt the floor weave under him. He looked up and saw Dale Reagan staring curiously. The latter then handed

the prescription to his customer, thanked him, and walked around the counter to where Grady stood.

"Grady?" Dale said quizzically. "What in the world?" Reagan's expression was part amusement, part bewilderment. "You look like you've been buried and dug back up," Grady managed a gray smile.

"I feel like I shoulda stayed buried," he muttered. Dale felt the weak man's forehead.

"You're hot. Take your temperature?"

"No. Tell the truth, I've been feelin' bad a few days, but just got worse last few hours," Grady heard his own voice say from far away. "Got an awful headache. Feel like my skull's gonna bust." Dale's face was serious, now.

"Take anything for it?"

"Well, I took a couple of B.C.'s, but they didn't seem to do much."

"Sit down over here a minute," Sale said, leading Grady to a chair in front of the prescription counter. The telephone rang as Dale seated the ailing fisherman and he answered it quickly, reaching for his pen.

"Yes air . . . yes sir . . . O.K. . . . I've got it. Say, Doc? Listen, ah . . . are you leaving now? Yes sir. Well, if you've got a minute, Grady Buttram is out here and he looks like death warmed over. What? Ha, ha. Yes sir. All right . . . I'll send him in. Right. O.K., right now." Dale replaced the receiver, made a note on the prescription he had received and walked quickly around to Grady.

Grady was beginning to feel nauseous as he eased gently onto the table in one of Doctor William Miller's treatment rooms. He was only barely aware of the glass and steel cabinet, the small white table and metal trays, bottles and instruments. He was, in fact, barely aware of his location.

"Grady." Doctor Miller, always in a hurry, walked into the room, a manila file folder under his arm. He paused in front of Grady and stared for a few seconds, then inserted a thermometer into his patient's mouth and dropped the manila folder onto the table. "Take off your shirt." No chit-chat, no kidding. Just business. Through his feverish stupor, Grady sensed a small wave of alarm. The Doctor he had known for years had taken one look at him and set to work. He fumbled with the buttons and removed his shirt.

"Undershirt, too," Doctor Miller said, glancing at his watch. Grady complied and the Doctor began examining him. Shortly, he removed the thermometer, read it and replaced it in the container on the table.

"How long have you had that rash?" Grady glanced down at his body and arms.

"Ah . . . last few days, I reckon. Heat rash, I guess." The hacking cough sent more spikes into his brain. "Coughin' like that, too. What I got, doc, pneumonia?"

"Well, you might have tsutsugamushi fever," the doctor replied, with his first small smile of the meeting.

"Sootsy . . . sut . . . what?" Grady asked numbly.

"Don't worry about that one. Grady, thing carefully. Did that rash start on your chest and stomach first, or did it start out on your arms and legs first?"

"It . . ." Grady started and then tried hard to think. "It started on my arms first. I'm pretty sure." His skull felt like an oven.

"All right. Now let's have another look," the physician said as he began examining again. When he raised Grady's left arm, he stopped and bent his head forward. "How long has that been there," he asked quietly. Grady twisted his neck and looked at a small round ulcer on his skin, surrounded by redness and covered by a black scab.

"That . . . ah . . . oh. That's a . . . that's a tick bite. Pulled him off fishin'."

"Fishin' where?"

"Upper Falls. Been up there a lot the last few weeks. Lotta ticks though. 'Specially where I found a spot up near a spring. Tough to get to. No path." Grady lifted his eyes from the ulcer to the doctor's eyes and that small movement hurt.

"Bad headache?"

"Man, yeah."

"Hurt anywhere else?"

"Well. My back kinda hurts, and my legs are achin' but nothin' bothers me like this head." Doctor Miller made some notes in the manila folder, then chewed on his pen in thought for a few seconds.

"Grady, have you ever heard of Rocky Mountain Spotted Fever?" The words fumbled through the patient's ears. He thought for a moment.

"Just . . . ah . . . tick fever, you mean? Is that the same thing?"

"Yes. I think you have it. A classic case. You have so many of the symptoms that I'm doubting myself. Fever, cough, rash that started from extremities and spread to the trunk, malaise, headache, and even the ulcer from the vector, or tick that was infested with the disease."

Grady stared, open-mouthed, at the doctor, trying to absorb the words. As he watched, his physician pushed a button which would sound a buzzer in his nurse's station. "I'm going to give you something for that headache, and also an antibiotic shot; then I'm going to give you some prescriptions. Now Grady, listen:" the doctor was staring intently at his patient. "I'm going to give you a prescription for some antibiotic capsules, and a couple of prescriptions for tablets for that cough and for your pains, headache and all. If you don't do anything else, and I'm going to tell your wife all of this, I want you to take all of the antibiotic capsules as directed, you understand?" Grady nodded dumbly. "The blue and yellow capsules are the antibiotic capsules. All of them, just as I say, all right?" Grady nodded again. The door opened and Doctor Miller's nurse walked in. The doctor gave her some quick instructions, and she left, returning moments later with two small vials and two syringes. Grady had never liked shots, but he scarely noticed these.

After Doctor Miller's telephone call, Lena Buttram had hurriedly changed clothes, exceeded her customary thirty-five miles per hour, and had actually squealed the tires a little halting her stationwagon in front of the doctor's office. Lena had been a nurse when she married Grady ten years before, and she had seen Rocky Mountain Spotted Fever . . . seen it and feared it.

* * *

Grady doesn't remember much about the next few days. The high fever, the headache, the nausea and general discomfort are recollections not unlike those from dreams . . . bad ones. He vaguely recalls the yellow and blue capsules which Lena made sure he took on schedule, and the other medications for his symptoms. He doesn't remember anything about Doctor Miller's first house call, and has only foggy images of the succeeding visits. Several days passed before his mind again stored memories.

* * *

The old Plymouth squeaked to a stop under the bay of Otis Peeler's Gulf and out came the angular operator, squinting and wiping his hands on a rag. "Three dollar?" he asked.

"Yeah," Grady Buttram answered, swinging open the door. "Wanna see something?" he asked as he walked around and opened the trunk. There lay a string of glistening bream, eight or nine of them, all nice ones. Otis clucked.

"Upper Falls," he declared, raising his mass of wrinkles.

"Upper Falls," Grady agreed.

"That's where you got that tick fever, ain't it?" Otis asked, as if wondering why he would go back.

"Yeah." Otis cleared the pump and clanked the nozzle into the pipe.

"Man, I don't believe I'd go back up there if I was you," Otis offered as he watched the pump dial. "You must want that stuff again."

"Naw. They have a vaccination for that stuff, you know. I'm gonna keep up my shots and not have to fool with it again."

"I didn't know that," Otis squinted. He watched the three dollars register and replaced the nozzle and gas lid. "Oil and water?"

"It's all right," Grady said, climbing into the car, and then he stopped. "Well," he said, turning to Otis Peeler, "Well . . . better check it." And with a mass of wrinkles somewhere between a sympathetic expression and a grin, Otis raised the hood. ♦

Sallie Middleton

Sallie Middleton's wildlife and woodland portraits have a "magical" quality that distinguishes her work from that of other artists. This "magic" is born of the combination of several elements: talent, the challenging art medium of watercolor, and life-long dedication, both to her art and to the study of the North Carolina natural world that she portrays.

Born and reared in Asheville, the attractive artist experienced early indoctrination into the worlds of both nature and art. Her father guided her on tours through the wooded countryside and explained the natural world as a great fairyland inhabited by tiny mystical creatures. Her enthusiastic searches as a child have resulted in the mature artist's highly trained eye for detail and love for the intricacy of nature.

Sallie spends considerable time "in the field" in close proximity to her subjects. First-hand knowledge of what she is painting is essential to her precise style. Below is a photo of the full subject depicted in the print, of which our cover is a portion.

Her uncle, Douglas Ellington, architect and watercolorist, cultivated Sallie's childhood artistic tendencies. The artist regards their long relationship with affection, and has said that she learned more about art from her uncle than from anyone else. Although she studied at several schools, she maintains that her most influential teachers have been her family, her surroundings, and her own study of the old masters — a mixture that sponsors unique, even "magical" work, in which every hair, every leaf, every feather of her subjects is authenticated.

As her reputation as a wildlife lover and artist has spread, Mrs. Middleton has become the recipient of unusual gifts from her neighbors. Wounded or motherless birds and animals are brought to her regularly and she nurses and often paints them. She does not subscribe to the popular practice of painting from museum specimens because she dislikes the Audobon-like postures in which most specimens are posed. Instead, the artist hikes into the woods or swamps where she carefully studies and sketches her subject, and often carefully digs up sections of its habitat to take to her studio.

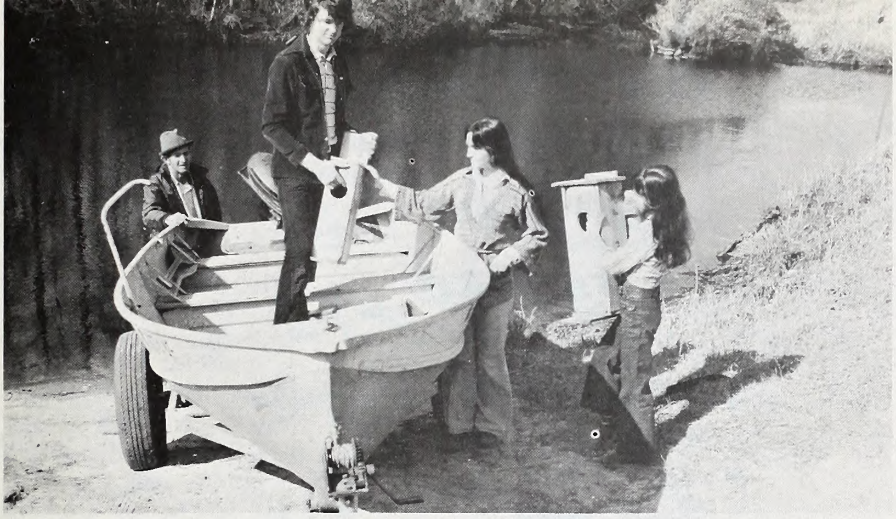
The artist resides just outside of Asheville with her daughters, Sallie and Mikell. She is considered one of North Carolina's foremost artists, and her original paintings command prices of up to $10,000. Because the demand for her art has grown beyond her ability to produce, Mrs. Middleton decided to publish her works as limited edition reproductions. Her original paints are now reproduced as high-quality prints by FoxFire Fine Arts, Inc. of Charlotte, North Carolina.

"Young Red Fox," the detail of which appears on this month's cover, is one of Sallie's most recent paintings and also the first of her new series of prints, *The Wildwood Series.* In her typical fashion, the artist has painted this playful four-month-old in an unconventional, yet very lifelike, pose. The fox is playing, catlike, with a huge Mammoth moth. With muscles tensed, the inquisitive young forest creature is ready to jump back the instant the moth begins to flutter.

The famous "wily" and "sly" characteristics necessary to the survival of adult foxes are still only piqued curiosity in this youngster, and Sallie Middleton has succeeded in revealing an unusual face of the fox. As she says of her subject, "Like most beings, when man isn't looking, the foxes laugh, mourn, love, play and have a life beyond hunting and being hunted."

Marcia Martin

For information about Sallie Middleton's prints, contact FoxFire Fine Arts Inc. 2730 N. Graham, Charlotte, NC 28206.



The Smiths have long been involved in natural resources conservation projects. Above, Roy (left) looks on as Leroy (in boat) and sisters Fran and Pam (far right) load wood duck boxes. The final step in the operation is erecting the wood duck homes (below).

WOOD DUCKS GET HELP FROM THE SMITHS

By JAMES H. GRIFFIN
District Conservationist
USDA-Soil Conservation Service

President George Washington was widely acclaimed for crossing an icy river to win a battle during the Revolutionary War.

By the same standard, the three children of Mr. and Mrs. Roy Smith of Tyrrell County in Eastern North Carolina deserve acclaim. For on a chili February day in the unusually hard winter of early 1977 Leroy, Fran and Pam Smith could have been seen breaking ice on Riders Creek near their home on Columbia, Route 1, to move ahead with the family wildlife project of installing nesting boxes for wood ducks, which have been described as North Carolina's "Number One Duck."

Working with their small rowboat, they used their oars to break through the ice — and put "duck boxes," as they call them, near the water for wood ducks raising a family.

For weeks before installation, Leroy and his sisters were busy in the barn behind the house building the boxes of rough-finished juniper lumber. Occasionally their parents would help, but the project belonged to the youngsters.

Mounting the boxes, they stuffed each one with soft, warm straw to make the nest — and then securely fastened the nesting boxes to trees near the dark, icy water. Pam and her father steadied the boat while Leroy and Fran fastened the nest boxes to trees.

The Smith youngsters come by their interest in conservation and wildlife naturally. Roy Smith has been a supervisor of the four-county Pamlico Soil and Water Conservation District since 1968, currently serving as secretary-treasurer of the large district and chairman of the Tyrrell County Board of Supervisors under that district.

He and Extension 4-H Agent Bobby Armstrong have worked to create an interest in natural resource conservation. Leroy has been active in 4-H demonstration work since 1972 and says the 4-H agent "has been patient with me and showed me how to do it" on a series of projects.

In 1972, Leroy's demonstration on use of pesticides to avoid any harm to wildlife was a State 4-H winner. The next year he came back with a demonstration on "How to Prevent Shore Erosion" and was first runner-up in the North Carolina Soil and Water Conservation Competition. Last year, a team demonstration with Chet Cooper on how to construct and use crab pots was a first place winner in the State Wildlife competition. This demonstration was titled "Wanted: Dead or Alive. Reward: A Tasty Treat."

Other activities have included livestock production, farm safety and camping—and in almost every case it has been a family affair, with sisters Fran and Pam joining in, with encouragement and aid from their parents.

The youngsters have attended 4-H camp, and Fran . . . a senior at Columbia High School . . . was Homecoming Queen in the fall of 1976. Pam, a fourth grader, was awarded second place in the 1977 district-sponsored conservation poster contest. Leroy, a sophomore, played varsity football in addition to his conservation work.

As a result of their combined accomplishments, the Smiths were named "Farm Family of the Year" by the Farmers Home Administration in 1972.

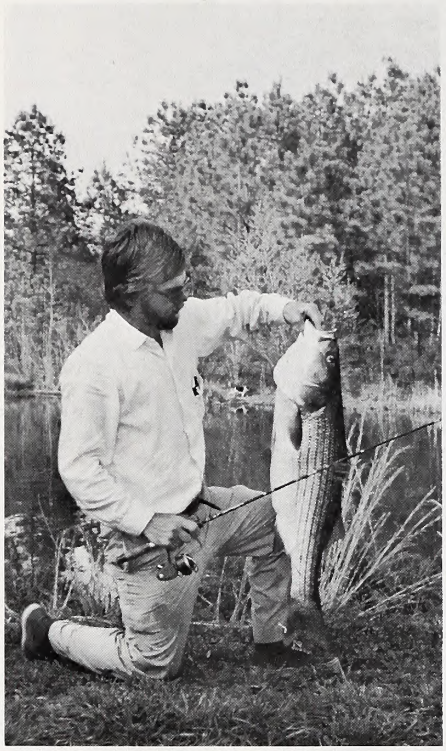
But with all their accomplishments and recognition, they think their combined efforts toward conservation of wildlife and other natural resources is the linchpin of their interest and enthusiasm.

For 1977, wood duck nesting boxes. Next year? Who knows? But it will be part of a conservation effort.

GASTON SURPRISE

by Gerald Almy

Photos by the Author



ONLY an hour of daylight remained when I pulled off the Northampton County road along the shores of Lake Gaston. But after four grueling hours behind the wheel of my pickup-camper barreling down Interstate 95, I needed to hear the soothing rhythm of the lake waters lapping on the shore. I needed to watch the ball of fire sun quench its fiery glow on the lake's distant horizon.

Doves careened gracefully in the glow of the afternoon sun as I walked over to the bridge. Far in the distance the muted melody of a trailing beagle blended softly with the evening lake sounds. The tranquil atmosphere soothed my road-weary nerves and, in a subtle way, prepared me for the drama about to be enacted.

I had half a dozen shiners salvaged from a fishing trip earlier in the week in Virginia and decided to cast these along the opening where the concrete bridge crossed the feeder creek on Gaston. The spot had been generous to me on trips past, yielding at various times crappies, bass, pickerel, yellow perch, white bass, channel catfish, and landlocked striped bass. Largemouths and the occasional striper usually made up the bulk of our catch though, and it was bass I expected to tussle with on this warm spring evening.

We all have a favorite rod and reel which we turn to time and time again, even though a larger or smaller outfit might be better suited to a particular fishing situation. Comfort and that "at home" feeling in the hand offered by the favored outfit often outweigh more practical considerations.

Hence, with Gaston offering the distinct possibility of a largemouth up to 14 pounds or a striper even larger, it would have been wise to leave my favorite ultralight rig in the rod rack. But since I mainly wanted to unwind and relax in the remaining hour or so of daylight, I didn't. Rather, I inserted a fresh spool of six-pound monofilament in the reel, in deference to the big fish possibilities.

Attaching a fine wire #2 hook to the fluorescent line, I squeezed on two small split shot about 15 inches above the hook and impaled a frisky shiner through the lips for casting. Settled on a comfortably flat rock, I launched the rig out into the flow coming between the bridge abutments and worked the minnow back seductively and slowly along the bottom, similar to the way most people fish a plastic worm. It's a tactic that has paid off well over the years on dozens of different species of game fish when they are holed up in deep water.

A feisty 14-inch largemouth soon found the retrieved minnow attractive enough to chomp down on. The bass fought well against the 4½-foot, 2-ounce rod, clearing water twice in head-shaking leaps. I was glad when I placed my hand gently around his belly to see that he was hooked lightly in the side of his mouth, making it easy to twist out the hook and send him gently back to the water in the best of health.

By now, a feeling of complete well-being had overtaken me as I continued casting in the sun's last warm glow. Its color had turned from gold to red, spreading a tapestry of warmth over a thin haze of cirrus clouds frosting the western horizon.

I was standing to stretch my legs when I made the cast into the middle of the current's flow. After the minnow sunk towards the bottom, I closed the bail and began the slow gentle pumping with the rod tip. The fish hit quickly and heavily, but not with the characteristic rod-jerking lunge most stripers exhibit. She simply sucked the shiner down into her gullet and was on. I set the hook hard, two times, to make sure the barb was driven in deep.

For about two seconds I thought it was a good-sized bass on the line. By the third second there wasn't any doubt: it was a "rockfish" and a big one. Line screeched from the ancient Mitchell 308 in the most sizzling whine I have ever heard. Even the 12-pound bluefish we'd battled in the Chesapeake Bay the past summer didn't burn line off the reel like this.

And she didn't stop! Not soon enough to keep me from breaking out in a cold sweat, anyway. For a split second I wished I had used a heavier outfit. But even before the fish finished its initial run, I banished this thought from my head. The sheer thrill of a monstrous striper rampaging on tiny tackle was worth it—lose the fish or land it. But I was determined to land this one, even though handicapped by the light line and equipment, my position on shore without a boat to follow the fish with, no net, and darkness rapidly eating away the remaining minutes of daylight.

Miraculously, the fine wire hook hadn't straightened by the end of the fish's first run, and she hadn't cleaned my spool out. I had the predictable panic as to whether my drag was set too tight, and loosened it as the fish progressed in her searing run. This would also compensate for the increased friction from the rapidly emptying spool, I

told myself. I pointed the rod tip at the striper during her initial surge, terrified that a sudden extra spurt of energy might snap the six-pound line. I'd worry about her cleaning me out when I began to see the black of the reel's inner spool. Fortunately, the fish stopped just shy of this critical point, after stripping about 160 yards from the reel's 190 yard capacity.

An odd thing happened next. The fish surfaced, but I didn't think it was my fish! She had stripped out so much line, so quickly, that I failed to realize the fish I saw boil water way, way out in the middle of the lake was the one on the end of my line! I thought it was another striper busting into threadfin shad schooled on the surface. Only after talking to another angler who watched the fight and hearing him say "Only surfaced once, didn't it?" did I realize that was in fact my fish 160 yards out!

As fast as the fish made her initial run, she made a 180 degree about-face and charged towards me. My stomach nearly dropped out when I felt slack line after her initial burst, fearing she'd spit the hook and was gone. But I reeled frantically in, just in case, and sure enough, the striper was still on—and half way back to me by now.

When I caught up with this tactic, the fish set off at an angle similar to the first dash. This time I got brave and held the rod up to make her fight the pressure from the bend in the fiberglass in addition to the drag. She was already beginning to tire, and made it only about 120 yards out on this run.

All the while I was eyeing apprehensively a buoy which she was near, but had so far ignored. Fortunately, she never did head for this disaster area, where in a split second the battle would have ended.

The next 10 or 15 minutes saw rough and tumble bulldogging on my adversary's part. Short, drag-jerking spurts were followed by head thrashing and bottom rubbing. Whenever I felt a slight moment of weakness, I pumped with a slow, steady pull of the rod as far as I could behind me, followed by frantic reeling as I pointed the rod tip out back towards the fish, always keeping the line taut.

By now I was physically worn. My arm muscles were as tight as a tautly drawn drum skin, partly from fighting the fish for close to 20 minutes, partly from nervous tension. But mentally I was feeling confident. I had met her two initial runs and didn't think she could muster another.

I was wrong, of course, and she soon charged a third time towards mid-lake, petering out by 80 or 90 yards. This seemed to sap her final energy for power bursts, but with six-pound test, I still couldn't just "walk" the fish into shore.

When I got her within 40 yards, she seemed to sense her decreased strength and in a panic struck upon a crafty tactic. She angled towards the riprap shoreline where sharp-edged stones were piled up for 100 yards as road reinforcements. If she'd done it quickly enough, she might have escaped with this trick.

Luckily, I saw it coming and started tiptoeing over the dangerously uneven rocks as rapidly as I dared, trying to head her off. Finally, about 75 yards down the lake shore, I got in front of her and pulled the fish in the direction it was swimming. This, as I'd hoped, stopped the maneuver and turned her in the opposite direction, away from shore.

I also gained quite a bit of line by running after the fish along shore and at last got my first glimpse of her. She looked awesome, finning just beneath the surface 20 feet out, her stripes standing out boldly even in the dim evening twilight.

She looked defeated. For the first time I had an uneasy feeling in my gut. The fish had fought with such determination and strength, I felt saddened by the sight of her defeated and stripped of her glory and power, finning weakly at the water's surface.

I wanted to release her. I pumped the fish close, hoping I could still do so, but knowing even as I hoped that it was not possible. As I drew her close it was spelled out clearly: she was past reviving. She had fought herself to death. The fish turned docilely on its back as I drew it within reach.

Landing was anticlimatic. There was no need for a net. I cradled the rod in my lap and reached both of my thumbs inside the fish's lower jaw. It thrashed weakly, splashing water on me in a last gesture of defiance. But the game was over. It was one of the prettiest, well-formed stripers I've ever seen—deep-girthed and free of blemishes or battle scars.

Mingled with my regret over killing the fish was a deep sense of satisfaction at having beaten my adversary against heavily stacked odds. Tempering any inclination towards a swollen ego, however, was my distinct awareness that LUCK was at least 50 percent responsible for landing this magnificent fish. On the hand scales she went an ounce shy of 20 pounds.

Mickey Johnson hefts the big striper that the author (opposite page) subdued on ultra-light tackle. Gaston is in the background and each year it yields quite a number of big striped bass as well as plenty of other fish.

PRIZE FISH

by Martha McDavid Wilson

"WOMEN just can't hold a candle to men when it comes to serious fishing." That's a rumor that I thought had long been laid to rest in this enlightened world of "equality." Perhaps I was misled by my father, Jack McDavid, a terrific man and in my opinion an unmatched sportsman. He raised three daughters with fishing poles and hunting trips, always telling us that both of these sports were things that girls could do as well, or better than boys. We were taught to observe the habits of our quarry, to respect and understand nature, to be humane, to catch or kill only what we planned to eat later, to obey the laws, to practice safety, and to enjoy the sport. Through the years I am certain that we have all released many more fish than we have kept.

When I married Don, he was thrilled to have a wife who could share his hunting and fishing trips and actually enjoy going. A bit skeptical at first, he soon learned that I was at home on the water or in the forest as much as he was, and often more familiar with them. We have enjoyed many excursions together, and now he has even been known to brag to the other men at work about his "out-door" wife.

In February of last year, my husband's work was responsible for us moving to Washington, North Carolina. My parents have a summer cottage on the other side of the Pamlico River, so we were familiar enough with the area to anticipate getting in lots of fishing after work and on the weekends. We rented a place ideal for just such purposes, having the property bordering the river in the front and a nice little canal in the rear. Making friends was easy, for most of our neighbors found the canal relaxing after a hard day's work, and nearly every evening the men would come out with their fishing equipment and the wives would sit around talking back and forth across the canal. A few of the women would fish half-heartedly, but I only saw one of them actually "seriously" fish. I did a little of both, the half-heartedness generally outweighing the seriousness. As a general rule, the men either ignored the fact that the women were fishing or let us have a little good-natured teasing.

For weeks we heard tales of the huge fish that unknown fishermen had caught in the area where the canal ended, and my husband could hardly wait to get home and make that first cast. After the baby was safely tucked in for the night, I would pick up my cane pole and either a bucket of crickets or a box of worms and go out to join him. Nearly every weekend we camped out on the banks of the canal, thoroughly caught up with the fishing fever. If I ran out of bait, Don would hand me his rod and reel and he would use the flyrod.

One day after work Don was out trying his luck with a new "Rebel" lure when I came out to talk to him. He had been casting for quite a while, and had gotten disgusted with the lure, so he handed it to me and got out the flyrod. I really hadn't planned to fish that afternoon, but I didn't want to go in and clean up right then either, so I started casting around while we talked. Eventually I wandered down to the legendary area at the end of the canal and started to feel lucky.

After a couple of casts I accidentally "snagged" a passing catfish. Don kidded me about catching a catfish on the lure I was using and walked around the canal end to put the fish in a friend's live-box. I was glad we had gotten home early and were the only folks fishing at the time. Before Don could get back around the canal, my line refused to reel in.

I first thought that I had managed to hook on to one of the many submerged logs in that area, and I was irritated that I hadn't been paying close attention to what I was doing to avoid such things. Don would be slightly unhappy if I lost his new lure on a log! I quit reeling in and suddenly noticed that the drag was whirring along as the line went flying out. My heart nearly leaped out of my throat as I realized that my "log" was alive! Quickly adjusting the drag, and promptly forgetting every bit of my Daddy's advice on landing fish, I started fighting for dear life just to keep from either having the rod yanked out of my hands or losing my balance and tumbling in the canal myself.

By the time I regained a little of my composure and started really fighting to land that fish, Don was flying around the canal and neighbors were beginning to poke out their heads to see what all the commotion was. Don kept yelling "What is it?" and all I could say was "Oh my gosh! Oh my gosh!" Then the "log" rolled over and I saw the prettiest bass I'd ever seen.

"It's JAWS!" I called to him, and he nearly killed himself getting to where I had gotten the fish up to the bank. I thought that Don was going in the water after the monster, and I just knew we would have to make a mad dash to the hospital when he crammed his hand down in that huge mouth full of hooks to grab him by the gills. He was more excited than I was. Exhausted, I looked around to see my crazy husband racing from door to door showing off MY fish to all the neighbors, and after tearing himself away from a group of them, he jumped into the car and tore off to a nearby store with an official scale to weigh my "prize" fish.

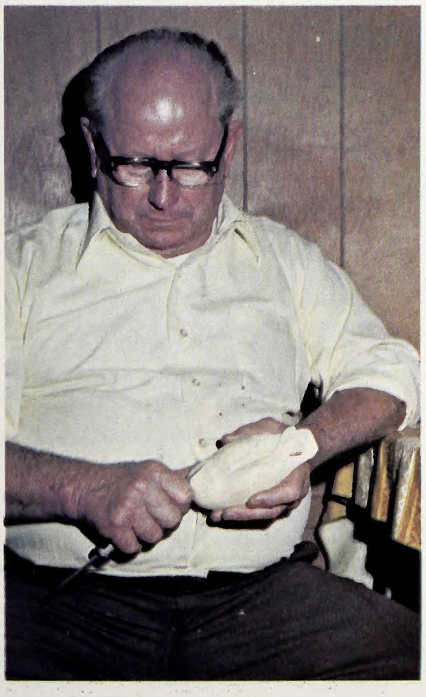
He soon returned with a downcast expression to inform me that my monster only weighed seven pounds and four ounces. He was deflated, but to a cane-pole fisherman it was sheer triumph. It was the biggest fish I had ever caught other than deep-sea fishing, and the biggest one that I know about coming out of that canal this summer.

Two days later Don came home with a rod and reel for me, and on about the second cast I landed a three- or four-pound bass. This time the local men were out fishing and one of them disgustedly threw down his rod, turned on his heel and marched off towards his trailer muttering something about it being time to quit when a mere girl could out-fish him in his own backyard. For nearly a week after that I had a lot of luck and took plenty of kidding from the men. It was Don who got kidded the worst, but he just smiled and told me how proud of me he was. It was nice to know that when our daughter gets a little older her Daddy will take the time to teach her to fish, and hunt if she wants to learn; and you can be sure that her Mama will tell her the same thing that her Daddy told her many years ago . . . "Little girls can hunt and fish just as well as little boys, sometimes even better!"

The Whittler

by Sam F. Poole
Wildlife Biologist

Photos by
Luther Partin



PAMLICO County has many assets—an affable climate, friendly folks, and excellent hunting and fishing. Deer, quail, rabbits and a few bears provide good hunting in this unique coastal country.

Fishing for trout, croakers, bass and bluegills gives much variety to the sportsmen from fresh water ponds, estuaries, sounds and the ocean.

In order to continue to have good hunting and fishing, wildlife conservation, management and law enforcement are necessities.

My friend, Reggie Piland, assistant county extension chairman, and I were making contacts to increase and enhance wildlife species in this county recently, and we stopped for lunch at the Lowlands Restaurant in Lowlands, North Carolina. The restaurant looks like an old country store, but serves delicious seafood and regular country style meals. We saw some delightful carvings and made the remark to Mr. Adrian Watson, who manages the restaurant, that we had never seen such fine carvings of ducks, quail, and shorebirds.

Mr. Watson said, "Wait just a minute! They are not carvings, they're 'whittlings.' I don't carve; I just spend a few minutes to maybe half-hour in my back room whittling every day."

We assured him they were great "whittlings." Reggie looked at a whittling of a wood duck and asked Mr. Watson to hold that one for him. We were interested in how and why he pursues this hobby and we asked him how long he had been doing this. Mr. Watson said three or four years and that he was improving all the time.

He whittles the best white tupelo gum he can find and sometimes paints the birds in their natural colors. For example, in the case of the wood duck, he had an excellent bird mount provided by Russ Jones of Kinston, who is a fine taxidermist. Some time in the past, Watson's first ones were done in juniper but he prefers tupelo.

We wondered why he preferred to do ducks. He said he didn't know and that he'd tried other animals, but just liked ducks, quail and shorebirds. He said that you need an interest, a steady hand and the ability to whittle symmetrically in order to produce these wild critters. He gave Mr. Robert Wrenn of Greensboro the credit for starting him on this productive hobby.

Productive? The birds cost from $30 to $40 each but he is not trying to get rich from his whittlings. Once he had an outstanding goose and didn't really want to sell it. But he put the goose on the counter with a price of $75. Needless to say, it was there only a few days before someone bought it.

Mr. Watson says that he doesn't whittle for money alone. If someone doesn't appreciate his work, that person can't buy it for any price since he puts a part of himself in each piece of art.

There are no two pieces alike; stop by and admire the craftsmanship in Lowlands. These works of art are unique and for that matter so is Mr. Adrian Watson, the whittler. ⬍

Adrian Watson works on another of his "whittlings," which when painted, will take its place among the collection of other game birds. Watson usually uses mounted birds as models, particularly for color. Painting is sometimes as difficult as the shaping of the birds.

WILDLIFE WAYS

by Margaret Moore
Sketch by Vicki Mercer

THE NOCTURNAL GOURMET

THERE'S nothing like an upset trash or garbage can to dim the freshness of an early summer morning.

When the robin has finished his wake-up song and the mourning dove starts cooing, and there's still a bit of dew on the grass-tips, how enjoyably alive it feels to be walking in the garden. That is, until you start back to the house for a tasty breakfast and see, at the far end of the house, an upset garbage can. Nothing poetic about that, to say the least.

It had occurred several times. "Those dogs!" I complained as I set about righting things. Finally, one evening a few days later I had an idea. I found a rock, a fairly large one, nearly as large as a basketball and put it on top of the garbage can lid.

"Those dogs will never push that off," I thought, for it was all I could do to lift it up to the lid.

Sleep came easily that night with the anticipation of victory. But in the darkness, the peaceful calm was suddenly broken by a strange grunting. It came from the direction of the garbage can. There, on top of the can was a raccoon, ring-tailed, dominoed, straining and grunting as he tried to move the rock. So "those dogs" I blamed for upsetting the garbage can were only one raccoon. He was persistent. He pushed and strained and grunted but could not budge that rock. At last he jumped down and lumbered off to the wild in complete frustration because he was denied his metropolitan fare.

BACK OF THE BOOK

- Letters
- Comments
- This & That

Cherries . . . Next Year

Dear Sir:

Just received my latest WILDLIFE. Was very interested in Mr. Johnson's cherry problem. I'm sure this has been one for all cherry tree owners at one time. Sorry that I didn't have the cows to help me and I'm sure many others don't. But let me tell you how I settled the problem with my fine-feathered friends and not a bit of trouble or harm.

I have cherry trees and so does my neighbor. Each year the birds are better at gathering time than I am if I am a day late. This year I was in the yard watching the trees and saw a bird land and start pecking.

I went into the shop and found a sheet of black plastic. Cut it into strips about four feet long and about an inch wide, sharp on one end about the size of a good black snake. I tied these around the tree and the end of the limbs about four to five to the tree. Do you know the wind blowing the plastic looked like the trees were full of snakes and my neighbor and myself really enjoyed those cherry pies for the first time. Please pass this on as I am sure others will reap a red harvest next year from an economical and harm-proof way to discourage our feathered friends.

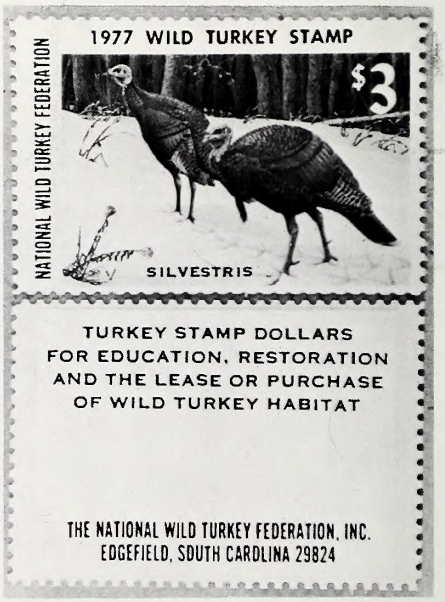
Jack Terrell, Burlington

Second Wild Turkey Stamp Available

A dramatic painting of a pair of Eastern wild turkeys by noted artist Chuck Ripper won the 1977 Wild Turkey Stamp competition at the recently held National Wild Turkey Federation Annual Convention.

Ripper's design has been reproduced on this year's $3 Wild Turkey Stamp, purchased voluntarily by turkey hunters, philatelists, collectors, and conservationists. All revenue from the stamp will be used for education, restoration, and the lease or purchase of wild turkey habitat under a unique Wild Turkey Trust Fund administered by the 25,000-member non-profit organization.

In addition to the limited stamp issue (50,000 printed), a signed and numbered edition of 1,500 prints (6½" × 9") has been produced and will be offered through reputable art dealers.



Stamp collectors are advised by Executive Vice President Tom Rodgers that a limited supply of the 1976 stamps are available. All donations are tax-deductible and orders for the stamps ($3 each—$30 per sheet) should be directed to Wild Turkey Stamps, Edgefield, SC 29824.

KNOW YOUR ENFORCEMENT OFFICER

Floyd L. Taylor

Wildlife Enforcement Officer Floyd L. Taylor was born June 21, 1951, in Williamston, N.C. and is the son of Mr. and Mrs. Dalton J. Rawls of Williamston, N.C. Officer Taylor attended Williamston High School and has an Applied Science Degree in Fish and Wildlife Management from Martin Technical Institute.

Floyd served two years in the U.S. Army and was employed by Gurganus Plumbing Company prior to his employment with the Wildlife Resources Commission on April 16, 1974. He was first stationed at Hillsborough, N.C. after attending the Recruit School at the Institute of Government in January 1974. Taylor also attended the Wildlife Basic School.

Officer Taylor presently aids in the three-weeks Recruit School as a physical training instructor and also serves as a defensive tactics instructor during the Wildlife Basic School. He is a member of the Orange County Fish and Wildlife Club, and the Southeastern Association of Wildlife Law Enforcement Officers. Officer Taylor is married to the former Patricia Diane Pollard of Williamston and they have two sons, Buster age 7 and Clint who is 2 years old.

DIVISION OF WILDLIFE ENFORCEMENT RECORD FOR MAY

HUNTING AND FISHING

Persons Checked	771,792
Total Prosecutions	598
Total Convictions	540
Total Fines Collected	$ 6,319.00
Total Costs Collected	$34,992.00

BOATING

Persons Checked	20,684
Total Prosecutions	2,179
Total Convictions	1,442
Total Fines Collected	$ 844.00
Total Costs Collected	$12,825.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

BOOKS

New Book on Migratory Shore and Upland Game Birds Available

Migratory shore and upland game birds - those other than waterfowl — are given exhaustive treatment in a new book edited by Dr. Glen Sanderson and made available by the International Association of Fish and Wildlife Agencies with the cooperation of the U.S. Fish and Wildlife Service.

The outgrowth of a ten-year program of research coordinated by the Migratory Shore and Upland Game Bird Subcommittee of the International Association, the book brings together the latest information on habits, populations, distribution, etc. The book makes specific recommendations for the conservation of a group that includes such little-known species as the black rail at one extreme to the widely popular mourning dove at the other.

Individual chapters cover the sandhill crane, rails and gallinules, American coot, American woodcock, common snipe, band-tailed pigeon, white-winged dove, mourning dove, and shore birds. A concluding chapter "The Resources and Their Values" summarizes the benefits from expanded management of this important group of migratory birds.

Copies of the book are being given an initial distribution to professional workers in the field and are available to the interested public at a cost of $1.00 each to cover handling and postage charges. The book may be obtained from the International Association of Fish and Wildlife Agencies, 1412 16th Street, NW, Washington, DC 20036. Orders should be accompanied by a check or money order in the amount of $1.00.

The Living Land: An Outdoor Guide to North Carolina

Marguerite Schumann

The first comprehensive guide to North Carolina natural areas describes 78 places accessible to the public, giving location, route, recreational and interpretive facilities, and pertinent facts of geological, biological, and historical interest expressed in laymen's language.

The list includes parks, forests, recreational rivers and lakes, wildlife refuges, certain permanent gamelands, and other sites of special natural interest; they cut across categories of federal, state, and local ownership.

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Photo by Chris Marsh

Sora Rail

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VOL. 41 NO. 9 SEPTEMBER, 1977

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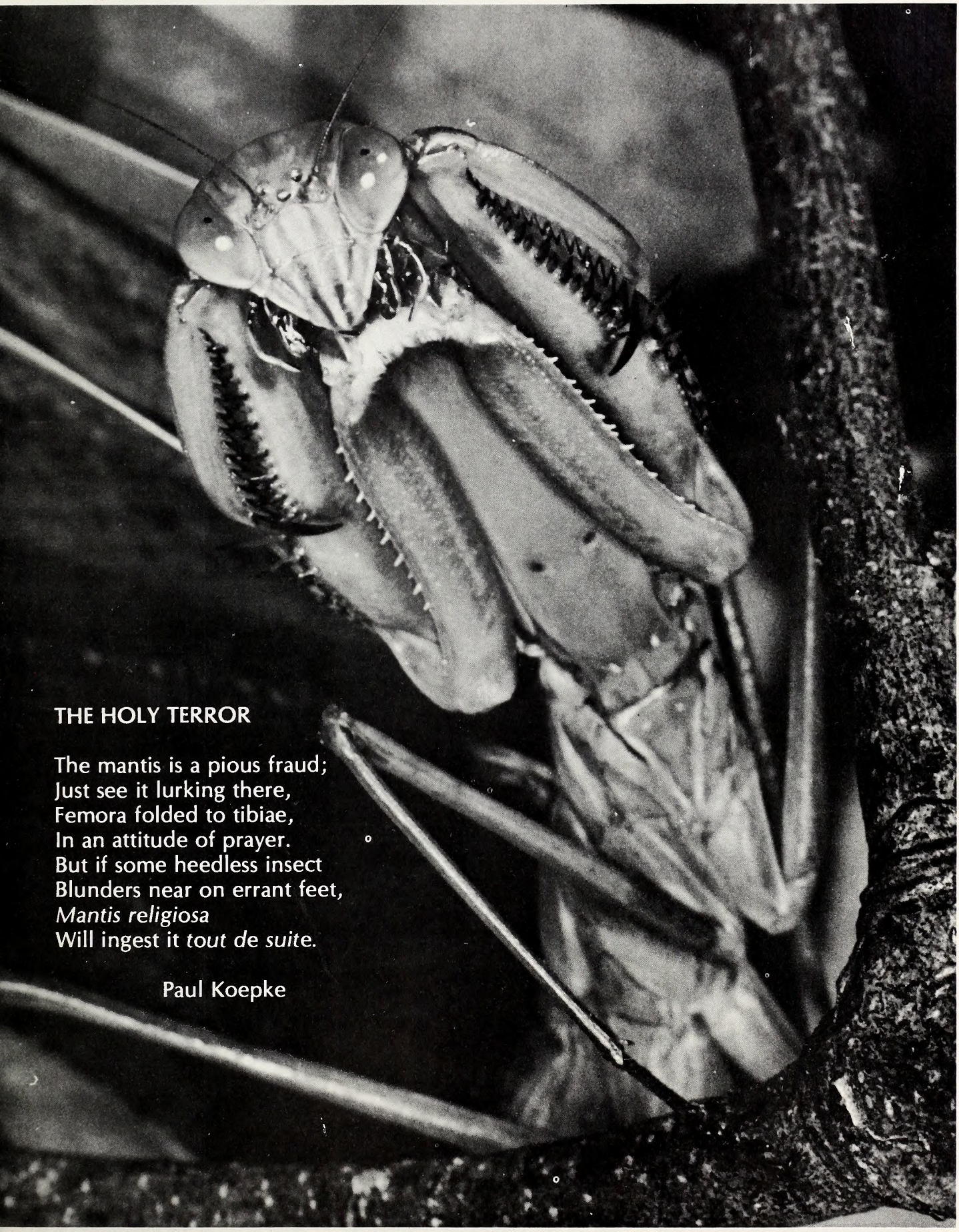
Ted Dossett ..... **Writer-Photographer**
Curtis Wooten ..... **Writer-Photographer**

The eastern sparrow hawk, perhaps more properly called the American kestrel, is our only small hovering hawk and is scarcely a foot long. This colorful little falcon, pictured on this month's cover among late summer flowers, feeds primarily on mice and large insects and rarely tackles large birds. As are all hawks and owls, the sparrow hawk is fully protected by law. Photo by Karl Maslowski.

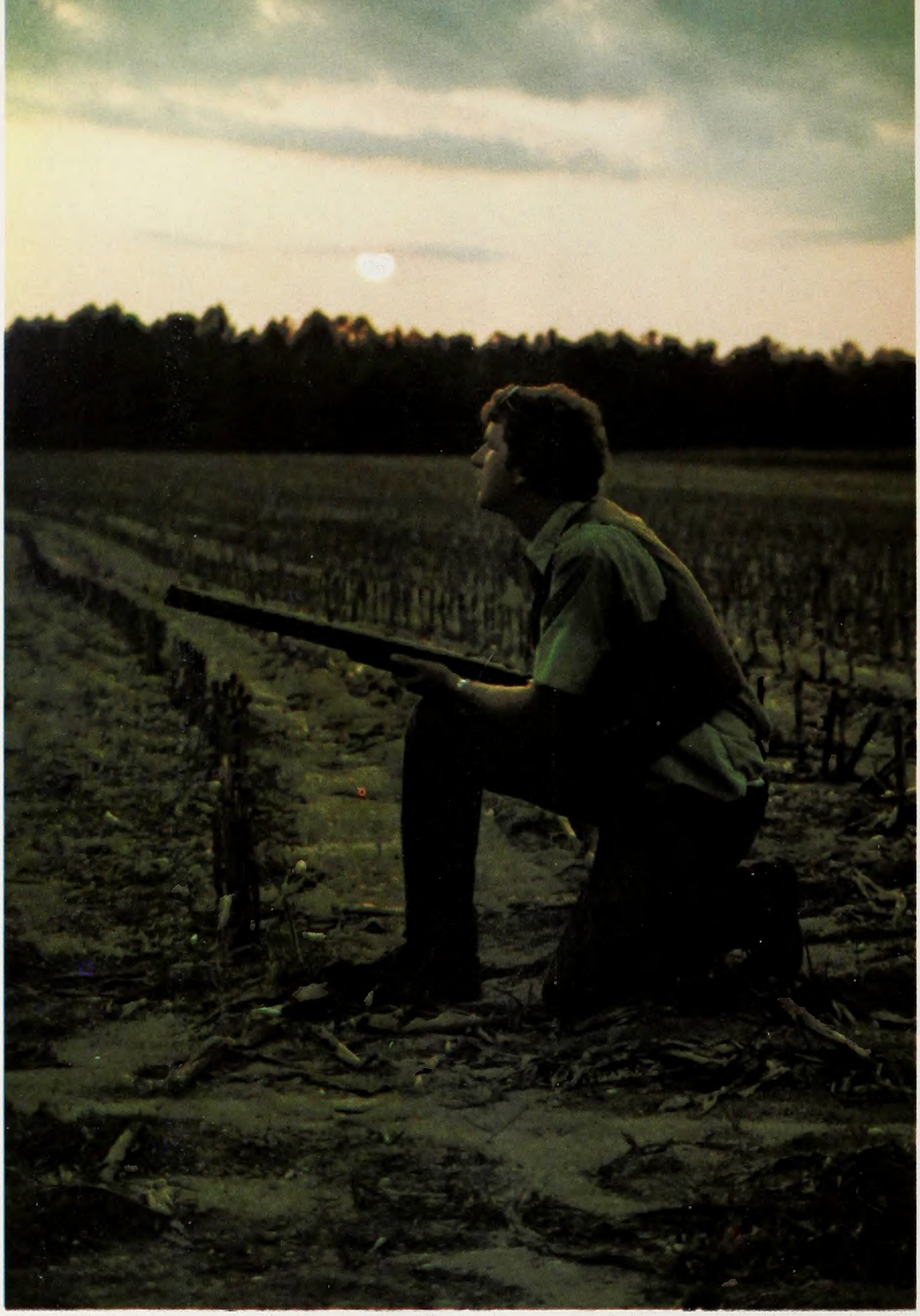


THE HOLY TERROR

The mantis is a pious fraud;
Just see it lurking there,
Femora folded to tibiae,
In an attitude of prayer.
But if some heedless insect
Blunders near on errant feet,
Mantis religiosa
Will ingest it *tout de suite.*

Paul Koepke

PHOTO BY TOM JACKSON



SEPTEMBER FEVER

by Frank Mooney

The mourning dove is definitely the most widely distributed of our game birds. These birds can be found in abundance in all of the 48 continental United States and legally hunted in 31 of them. I have nothing but compassion for the hunters who are missing this grand sport.

Dove shooting can be about the trickiest of all wing-shooting. These birds are not only fast but have a habit of dipping and diving so gracefully that some hunters stand in amazement without firing a shot. With a strong wind aiding the already erratic flight pattern, the mourner is peerless in the September sky.

There are many factors for the popularity of the mourning dove. No long trips are involved; no

freezing weather to combat; no guides or expensive equipment is needed, and best of all the dove is plentiful, providing a lot of action and after the hunt can provide a tasty meal fit for any gourmet.

A feeder on weed seed and wasted grain, the dove is usually easy to find near the feeding area. Electrical wires and dead trees are two of the best places to see these birds resting. The habit of gathering with their feathered friends and perching around the feeding area before flying down to feed can often be their downfall. A knowledgeable hunter can often waylay the birds as they tool their favorite flyways to certain dead trees or cruise over the feeding area looking for company. I have had good luck pass shooting when I was unable to find feeding grounds, but have found birds trading back and forth between feeding, watering and roosting sites.

Some hunters frown upon shooting doves at the roost. Bret, my teen-age son and I shot doves one afternoon at a small roosting site. I was interested in seeing what effect this had on the local birds. This area was ideal for doves because of water, feed, grit and roosting area all together. On our next trip to the area we were very upset upon seeing where a bulldozer had flattened most of the trees; however, this did not stop the birds from winging in and roosting among the fallen tree tops and perching upon the high mounds of dirt excavated by the heavy machinery. After sundown the birds continued to pour in as Bret and I watched from the truck with guns cased. Pat, our yellow lab couldn't comprehend us missing out on all this great shooting time as she watched the doves drop in. Her soft whines and puzzled looks needed no words.

PHOTO BY LUTHER PARTIN

The mourning dove supply remains reasonably stable year after year even with a substantial harvest each fall and winter. It is a fine game bird.

Heavy rainstorms or a sudden plunge in temperature can empty an area of doves. Doves are warm weather birds, thus explaining why they are such early migrants. During the month of August many birds head south, I have seen an area on the verge of overflowing with doves only days before the season, then doveless when opening day drags in. Most of the doves are killed during the early part of the season due to heavy hunting pressure, young birds, and more birds in the area. But as the season progresses, hunting pressure falls off drastically; less wary birds are killed, with local birds heading south so it's always a good idea to hunt early but don't give up just because the hunt is becoming more of a challenge.

Incidentally, I have had many great hunts near the end of the season and you can too by following some sound rules. Older birds notice movement on the ground at greater distances. I have seen hunters standing in an open field during the first days of the season getting plenty of action but the surviving birds learn fast. Now it is time for full camouflage clothing, natural and shaded blinds whenever possible. A camouflaged hunter without a blind but crouched under the shade of a tree or bush can continue to fill his bag limit in the last days of the season. A well-controlled lab or golden retriever doesn't seem to over-alert a dove and makes for some outstanding field work when birds have fallen in water or high weeds.

Doves are whimsical, unpredictable and nomadic but despite all this, a seasoned hunter can pinpoint the action and consistently carry home his limit. A bird that can fly 30 miles in 30 minutes would seem almost impossible to gun down. Being a creature of habit plus being dependent on waste grain, weed seed and open feeding grounds this bird provides many hours of enjoyment.

Often a few days of prescouting before the season by riding the back roads looking for birds perched in dead trees or on wires running through harvested grain fields can cut down tremendously on the hunter's odds. There's nothing better to get the hunter in the right frame of mind than knowing the day before the season that birds are feeding in an area where he already has permission to hunt.

Finding a water hole where doves drink regularly can be an added bonus for any nimrod. Doves seem to prefer muddy or stagnant water and due to their whimsical nature pass up many farm ponds or streams that seem ideal for them. So if you are lucky enough to locate one of these magic spots, guard it with your life. Doves are usually wary when coming to water and the least movement at the wrong time will send them scurring away. I have had doves to land within feet of my hidden position near water but this is usually the exception and not the rule.

Much has been written about gauge size and shot size. Much depends on the hunter and the particular situation at hand; however, most hunters agree that a 12 gauge and 7½ or 8 shot will fill the bill. Regular field loads are the best by my way of thinking. With the daily bag limit of 12 birds and most hunters need three to five shots per bird, that calls for a lot of gunsmoke to limit out. Three or four boxes of high-brass loads can bruise the hunter's ego during all this excitement.

If the weather doesn't send all the great speedsters south before the season opens, this season should be rewarding for the hunters with all the local birds around. The symptoms are beginning to show, I always catch the September Fever.

PHOTO BY JACK DERMID

Successful turkey broods are rarely adversely affected by spring gobbler hunting. Hens on the nest or with young are seldom seen by the hunter.

Spring Turkey Hunt Update

by R. Wayne Bailey

Six years have passed since a moratorium was placed on fall and winter male-only wild turkey hunting in North Carolina. Beginning in 1972, turkeys could be legally hunted only in a spring season and then only if the birds were bearded. That change in hunting was designed to reduce or halt the downward trend in turkey numbers that had been evident for many years in North Carolina. Due to the numerous variables involved and to insufficient lapse of time, it is probably impossible to accurately determine the effects of the switch to spring-only hunting. Habitat changes, for example, no doubt exerted a greater influence than the kind and time of hunting.

Records of turkey harvests have been maintained since 1972, three years prior to enactment of a regulation requiring a kill report from each successful hunter. Those records suggest that the turkey has "gained some ground," especially in the last two years (Table 1). (Due consideration should be given the fact that the last three years were regarded as poor ones for turkey reproduction.) The improvement appears most pronounced in the Piedmont. Several landowners in that region report population increases on their holdings and most attribute it to the aforementioned moratorium on winter hunting. However, it is believed that the greatest increase in turkeys has occurred in the Mountains as a result of restoration efforts there in the last decade. An anticipated increase in hunters in that area, along with improvement in their hunting skill, should soon result in much larger harvests.

Due to widespread destruction of habitat, the turkey in Coastal Plain areas, excluding U.S. Marine Corps Camp Lejeune, is in trouble. Significant improvement in that region is not expected.

Considering that opposition to the spring season still exists in some quarters, it is perhaps appropriate to summarize the case for that season. That case is so biologically sound and proven

Table 1. Wild Turkey Harvests, 1972-77.[1]

Year	Coastal Plain	Piedmont	Mountains	Total
1972	24	96	11	131
1973	24	62	8	94
1974	28	60	10	98
1975	21	75	8	104
1976	45[2]	94[3]	14[4]	153
1977	32	105	14[4]	151

[1]Kill reporting became mandatory in 1975. It was voluntary in previous years.
[2]Includes 8 killed in a fall either-sex season on Camp Lejeune in 1975.
[3]Includes 9 known, but unreported, kills.
[4]Includes 7 known, but unreported, kills.

that professional wildlifers opposing it are about as rare as rabbits on Mars. Here are the highlights:

In a spring season —

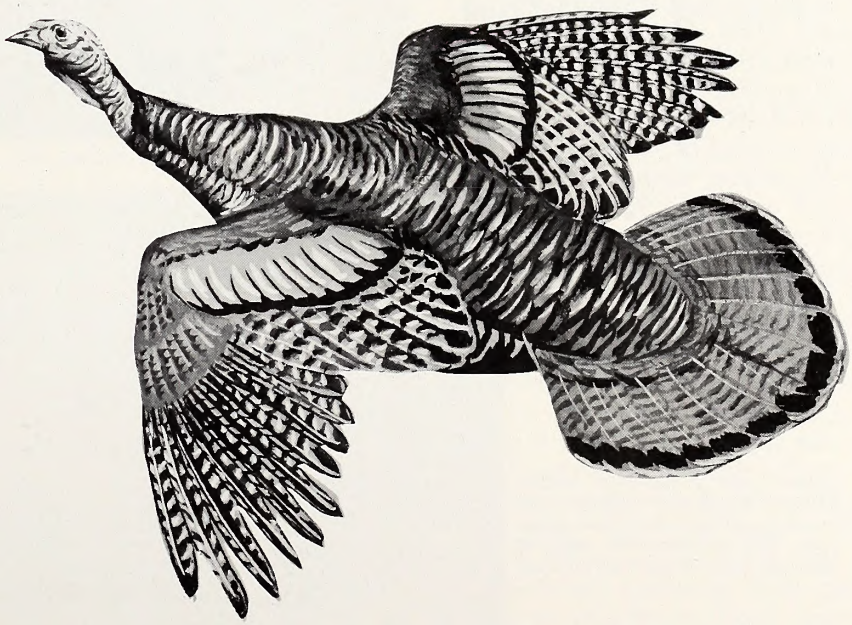
- Hunting is truly selective for males. The objective is to listen for gobbling and to lure the gobbler within gun range. The season is held when hens are laying or incubating, hence relatively invulnerable.
- Removal of a large portion (or even *all*, if it were possible) of the males cannot affect production of young because the season is held after the peak of mating. Male sperm cells live in the oviduct of the female and are viable for at least 56 days after mating. Hence, following a single mating, a hen can lay two or more clutches of fertile eggs in case her nest(s) is destroyed.
- Turkeys are larger and more beautiful trophies than those taken in fall and, contrary to some beliefs, just as tasty.
- Turkey hunting is more exciting, thus more esthetically rewarding, because of the gobbling.

Nowhere in the nation has legal spring turkey hunting been a factor causing a decrease in a turkey population trend. Minimal, even newly restored populations can be safely hunted in such a season because there is little likelihood that kills would occur, and if they did, production of young would not be curtailed. On the other hand, fall-winter seasons are known to severely depress populations in areas where they have long been held, resulting in "traditionalization," high hunting pressures, and development of hunting skills.

The wild turkey suffers and struggles for existence in North Carolina, but not as a result of spring hunting. It suffers from habitat loss and deterioration due to industrial, agricultural, and human growth; excessive clear-cutting of forests; and conversion of natural forests to monocultural (pure pine) systems. It also suffers from excessive human disturbance, illegal shooting, and excessive dog activity during the reproductive period. It therefore follows that those interested in helping the wild turkey should:

- Work to preserve, improve, and protect turkey habitat.
- Support hunting regulations, including the mandatory kill reporting law. Harvest inventory is the best indicator of the turkey's success or failure.
- Seek means of curtailing the number of dogs afield during the April-July period.
- Keep abreast of turkey problems and developments; that is, become informed. This involves keeping in touch with Wildlife Resources Commission personnel in your area and following the current literature on turkeys. A step in connection with the latter is to join the National Wild Turkey Federation, Box 467, Edgefield, S.C. 29824, a non-profit organization of turkey enthusiasts dedicated to the perpetuation and management of the turkey nationwide. That organization publishes a bimonthly magazine, *Turkey Call*, devoted exclusively to turkey conservation and hunting. It contains articles that might be helpful *to you* in bagging one of those "tree shakers" next spring.

For detailed information on the status of the turkey in North Carolina and on the WRC's turkey management program, write for a free copy of "The Wild Turkey's Management and Future In North Carolina." Send your request to: Wildlife Resources Commission, I & E Division, 325 N. Salisbury St., Raleigh, N.C. 27611.



Canoeing Doubleheader at Raven Rock

by Tom McCloud

Besides green trees, growing grass and plowed fields, the breezes of spring also bring with them warm weather outdoor activities, such as golf, tennis, baseball and water sports. As cold weather apathy thaws, many North Carolinians go swimming on the coast, boating on large inland lakes, fishing on farm ponds and, for an increasing number of people, canoeing on some of the thousands of canoeable miles of river in the state. Thus far little has been done to provide for general public usage of this most natural of recreational resources. Only the South Fork of the New and the unnavigable Linville are protected by law, and there is not a single designated state canoe trail and only one, the Lumber River Canoe Trail, which was a local project. Several of our state parks such as Pilot Mountain and Cliffs of the Neuse contain canoeable waterways, but only at Raven Rock State Park near Lillington, has an effort been made to utilize the river as an addition to the recreational experience, and that effort is what this article is all about.

Two years ago Raven Rock Superintendent Howard Hodges was faced with a dilemma: If he developed a portion of the new 2,700 acre park, which straddles the Cape Fear River, for use by canoeists he would be encouraging greater usage of the river — but at the same time he was disturbed by the number of obviously ill-prepared folks already using the waterway. The solution was two fold: utilize the river AND provide for training in canoeing. First, an area of old pastureland along the river was set aside for individual and group camping. (See "River Trip", July 77 "Wildlife") Facilities remain primitive and are tied only by trails to the Park Office, thus retaining a remoteness much sought by many canoeists. Secondly, Hodges contacted us in the Carolina Canoe Club about conducting canoe training sessions at the Park, and we were most happy to oblige.

Our canoeing doubleheader consists of one day of training and, the next weekend, an overnight canoe trip with camping at Raven Rock. This year's doubleheader started on June 4th with a warm-up on a farm pond near the Park office. Four of us from the CCC served as instructors to approximately 30 students, who had traveled from as far away as Wilmington and Winston-Salem to attend. They came with all sorts of equipment and various levels of skill, and were anywhere from 6 to 60 years old.

During the 1½ hour morning session topics included an equipment review, instruction in a few rudimentary paddle strokes, demonstrations of cross-gunwale rescue and the advantages of extra flotation in a canoe. Safety principles, including the contents of a first aid kit were stressed.

PHOTO BY TOM MCLOUD

PHOTO BY TED DOSSETT

Actual river experience (right) followed intensive training in canoe handling under controlled situations. The fast-growing sport of canoeing must include such training.

Safety rope, spare paddle, bailer, painters (the polypropylene floating ropes tied to the end of the boat) were listed as necessities. Several buoys were placed in the pond to provide a slalom course in which to practice the various strokes. Since only the surface can be touched in such a short session, pamphlets from the Red Cross and American Whitewater Affiliation were made available and references given to additional information sources.

The first "game" of the doubleheader was that afternoon, played on the Upper Little River, a lovely tributary stream of the Cape Fear located just south of Lillington. Many of these beginning canoeists soon realized they had much to learn before mastering the craft. The slow-moving current pushed them into the overhanging branches, they careened from bank to bank, ran into each other, and went backwards, sideways and even upside down. Before long, the stream drops over several small rapids, but by this time most could control their canoes. You can only learn to canoe by doing it! The day ended at the Rt. 217 bridge at 5 pm. It had taken us three hours to travel four miles on the river, which is three times normal.

The second game of our canoe doubleheader was held the next weekend. The Cape Fear between Rts. 42 and 217 is a natural canoe trail. The 25 mile distance is nearly split in half by the camping facilities at Raven Rock Park, and the river, with only infrequent class 2 rapids is big enough to be canoed year-round carrying gear in the boat. Our group of 19 boats put into the river at Rt. 42, blessed with excellent weather but exceedingly low water. After paddling for an hour we portaged over the left side of the Buckhorn Dam, and, after a short "time out" to apply duct tape to a leaking canoe, began to go down the Buckhorn Falls. This rapid, though formidable at high water, was so low that almost everyone had to step out of the boat and push off rocks on a few occasions. The remainder of the afternoon was spend enjoying the wildlife and scenery while paddling slowly downstream. Snakes, turtles, catfish and gar were seen in the water while hawks, kingfishers, great blue herons, and a couple of osprey graced the air. The vivid blue of pickerelweed flowers was abundant and the buttonwood was in full bloom.

A few fishermen cast lines out across the broad, flat river, and one fellow pulled in a big one as we floated past. At Lanier Falls, near the northern boundary of the Park, we took a "seventh inning swim" and body-surfed through the rapids. Not only is it great fun, but also gives practice in the proper way of floating through fast water: on your back and kicking your feet on the surface in front of you. Here, as well as at several other places, the ruins of the 1840's era system of dams and locks that were constructed for river navigation can be seen. The "Raven Rocks" on the west bank are particularly impressive when viewed from water level. Then only a short distance remained to the group camping area of Raven Rock Park, where we set up tents and cooked supper over an open fire.

Sunday morning found us packed and ready to complete the journey at 9 a.m. With steady paddling, we reached the wildlife access ramp on SR 2069 south of Lillington at noon. Most of our beginners chose to take out here, but eight canoes continued an additional eight miles to Erwin. This last section of the Cape Fear contains more numerous rapids and is frequently paddled by whitewater canoeists. Those who reached the Rt. 217 bridge at 4 p.m. had traversed some 25 miles of the Cape Fear River, and had seen it from a new and unique perspective — sort of a floating nature walk. Their learning as canoeists had just begun, but what better way to start than by combining business with pleasure on this Raven Rock doubleheader.

PHOTOS BY TED DOSSETT

Basic strokes and paddle handling plus many other fundamentals were demonstrated at pond-side (above) before the group was introduced to the water. It was a matter of practice from then on.

ILLUSTRATION BY DUANE RAVER

Bream at the Edge of the Wind

by Joshua A. Lee

Just about any serious angler would rather tie into a three-pound largemouth than a ten-ounce bream, and I can't say that I'm any exception on that score. The delectable anxiety that comes from the hope that the next cast will produce a tackle buster is the stuff of bass fishing experienced only rarely by those who try for the humble bluegill. Yet in the waters readily accessable to most fishermen, keeper-sized bass may be hard to come by, and the time between strikes can often be measured in hours, if not days. These same waters are, more often than not, teeming with bream and other panfish, so that if a purist can shed the notion that to fish for them is plebeian, some fast and steady action awaits.

As devotees know, there are about as many ways to take "bream-fish" as there are different colors in the assorted stocks that inhabit most public waters nowadays. Natural baits, crickets, red wigglers, and mealie worms, particularly when fished over beds, are popular and effective. Catches of 100 or more per party are not uncommon when the fish are bedding in late spring. Small artificials on ultra-light spin gear, or fly rod, work well on bedding fish, but fishing bream beds has never appealed to me.

In the first place, it's just too blamed easy, and in the second, my conscience twinges at the thought of taking old copperjaw directly off his connubial couch. It's far more sporting, I think, to stalk him earlier in spring, in the heat of mid-summer, or especially in autumn, when he's fat, alert, and hungry, and ready to turn tail and streak for the depths at the least disturbance. Make no mistake. The bream, when not in an amorous mood, is among the wariest of fish. The big, hump-shouldered kind must be approached with the utmost caution if they are to wind up on the stringer.

Here in North Carolina there are many medium-sized impoundments with extensive shallows and steep banks with submerged shelves, ideal waters for bluegills. One such fishing

hole is Lake Wheeler, one of four such impoundments in the Raleigh municipal water system. Lake Wheeler is a fairly broad lake with several projecting points and sheltered bays, a topography that describes many such waters in the southern uplands. Spring and fall are apt to be windy in central North Carolina. However, if the breezes aren't kicking up at such a velocity that one is plagued by back-eddies on the sheltered sides of the points, there can be some dandy fishing for bream on light tackle.

In spring my first preference is for a 7½ foot fly rod with a No. 10 or 12 popper with rubber legs snipped off short. Local bream seem to prefer yellow or white, but those choices might actually indicate the preferences of the angler. The best action comes in early, or mid-May, just before the males begin to fan out beds in the shallows. At that time fish are likely to congregate in schools near sunny banks a hundred yards or so from traditional bedding sites. I've taken as many as a dozen fat fish from such a lie. Just work a bank carefully until a concentration is located. Then stand off about 30 to 40 feet and cast to the action. Working inward to the periphery of a school is least likely to spook the fish. But, since I've never cared to catch any great number of fish at any one time, I usually cast directly to the center of the lie.

Earlier on, in spring when crappies are bedding, bream can be taken on muddler minnows, or maribou streamers, fished deep. Bluegills like to lurk around crappie beds taking eggs. Crapies, of course, also favor light-colored streamers, and the techniques for taking them is the same for those early bream. Just pitch to a likely looking spot and let the lure sink slowly. Those early bream seem unusually strong for their size, a delight on a wisp of a flyrod.

Small insects are abundant in autumn, particularly assorted sizes of flying ants. These are swept into lakes by the millions to drift before the wind and settle in rafts where the breezes eddy and die in the lee of projecting points. Bream take advantage of the bonanza; it is not unusual to see a dozen or more fish bumping the surface over fairly deep water, at the very edge of the wind, as it were.

The approach when stalking bream at the wind's edge is important. Don't go barrelling through the rises with your outboard churning full tilt. Ease around the point, preferably by oar or paddle, and settle a good cast-length away to the leeward. Dress your line well and then pitch to the concentration, or to individual rises on the periphery.

Unfortunately bream rarely take poppers when rising to floaters over deep water. In my experience the best lures are little fuzzy-bodied flies with hair hackles, fished wet. These are called gnats locally, and the commercial versions I use resemble the black gnat in form and size. I've had the most consistant results with all-black, black with red body, and black with white body. However, as all bream fishermen know, their quarry can be mighty finicky about color. Patterns that produce one day might be spurned the next. The best offering on any outing usually has to be worked out by trial and error. A fine tippet at the end of an eight-foot leader and a double-taper line suited to the rod delivers the lure with the least commotion.

Cast to a rise and let the lure sink slowly. Bream rising to floating insects don't linger near the surface. Rather, they cruise a few feet beneath the surface and peer upward on the lookout for tasty morsels. Once a likely target is spotted, the fish rises cautiously, strikes quickly, and darts downward at an angle. Thus a feeding bream's movements describe a right triangle, with the rise along the perpendicular, and the descent along the hypotenuse. The rise might occasionally be at an angle, but the slant is never as much as on the trip back down.

I've found it best to cast a few feet to the side of a rise and hope that I've anticipated the direction in which the fish was headed. Keep the line under light tension by stripping in slowly with the rod's tip about 30 degrees above the level. That way the angler can feel the slightest bump at the lure. Most fish, if feeding strongly, will hook themselves if there is no slack in the leader.

Where fish concentrate in large numbers action can be fast and furious, but such is the exception rather than the rule. Most of the rises are usually several feet, or yards, apart. The trick then is to try and divine the direction in which individual fish are working and try and head them off. Watch a succession of rises and cast well ahead of the last bump. With any kind of luck you'll place the lure ahead of the fish rather than behind it. If the rises tend to stay put, you're in business. Just settle down and cast directly to bumps on the surface.

What about dry flies? These take fish, particularly the grasshopper patterns. However, if the concentration of naturals is heavy, dries usually have too much competition to be really effective. Fishing wet places the lure down where the fish dwell, giving old coppernose an additional option. Beyond that, hungry bream are hard on dry flies, and the time spent in drying and dressing could be more profitably spent fishing.

Can one expect to take large numbers of fish working the edges of the eddies? Well, that depends upon various factors. Should the wind slacken abruptly so that the rafts of insects spread out over the sheltered bays, the surface for hundreds of yards around can erupt with feeding bream. Then one can, for short spells, catch fish until the arms tire. However, paradise does not happen every day, nor every year for that matter. A more reasonable expectation would be a dozen, or so, bream for an afternoon's effort, not at all bad when one considers the difficulty in luring fish moving seemingly at random over open water.

One of the nicest things about fishing the rises happens after the fish cease hitting over open water. All along there have been a few bream working the banks, and these seem to linger over their supper longer than those off

Continued on page 27

A Close Look at THE OSPREY

Story and Photos
by Gary Stevenson

Al pulled the helicopter to an abrupt halt and dropped twenty feet to avoid the angry osprey flying toward us at full speed. We hovered there, watching to see what the bird would do next — we had invaded its nesting territory and it seemed quite willing to take on this noisy contraption in defense of its home. Although I couldn't hear anything over the roar of the engine, I could imagine the big hawk's vehement screams as we circled closer to see the nest with three half-grown young inside. I spotted the second parent circling high overhead. Otto and I watched the two adults closely as Al moved the 'copter back and gently put us in the water 75 yards from the next tree. If the adults came too close, they were in danger of being pulled into the whirling blades and killed. They didn't offer to move in closer, so Al shut down the engine while Otto and I climbed down into the knee-deep water and unfastened the ladder from the pontoon.

We were just off the northeast shore of Lake Mattamuskeet at Mattamuskeet National Wildlife Refuge in Hyde County, North Carolina (page 20, June, 1976 "Wildlife"). I was accompaying the U.S. Fish and Wildlife Service's East Coast Biologist Otto Florschutz and Special Agent-Pilot Alvin Noltemeier on the last leg of their annual osprey nest check/banding project at the refuge. The project was begun in 1973 to gain some insight as to the number of nesting pairs, nesting success, and migratory habits of this handsome raptor.

The American Osprey (*Pandion haliaetus*) is widespread as a species, breeding from the Gulf of Mexico north to Hudson Bay and southern Labrador. Migratory throughout the northern part of its range, it winters from the Gulf states south. It feeds almost exclusively on fish and is thus always found near water. Although pesticides and habitat destruction have caused some decrease in range and numbers, many of us have seen this large hawk sailing on characteristically crooked wings over lakes, streams, or the seacoast as it hunts, slowing now and again to hover over a likely spot. It is not a deep diver; when prey is spotted, it drops feet first into the water, momentarily disappearing or showing just its wingtips above the surface. If the dive is successful, the osprey rises heavily from the water and invariably turns its catch parallel to its line of flight with head forward. It then flies to its nest or some other favorite perch and devours its meal. The male osprey will bring food to nestlings or the incubating female during the nesting period, but for the rest of the year each bird must fend for itself. They do not seem to prefer any certain kind of fish; at Mattamuskeet we found pieces of catfish, bluegill, and other common species in the nests.

Osprey Nests

Ospreys prefer to nest in solitary trees (live or dead) in or close to water, and again are not partial to any one species. They are not at all particular about height. If no better site is available, the hawks are content to build on buoys, channel markers, telephone poles, or any other prominent object capable of supporting a nest. Aeries are constructed mostly of large sticks and lined with grass, bark, or just about anything else the bird can pick up. I saw large clumps of grass with root mass and soil still attached in several nests in Mattamuskeet, probably taken from plowed fields in the area. Other unusual objects such as toy boats, rag dolls, old boots, door

The helicopter (above right) was a valuable time-saver in the nest checking process. Empty nests were quickly bypassed and biologists landed near occupied nests (below) and banded the rapidly maturing young. Nestlings too small to band (right) were recorded and banded later.

mats, and bleached bones have been reported in nests. New material is added each year (this aids in determining if a nest is still being used) and may eventually kill the tree and/or cause it to fall under the weight.

April marks the beginning of the nesting season in North Carolina. The ospreys have returned to Mattamuskeet by this time and have begun rebuilding their aeries. They mate, probably for life, at about two years of age, but there is some speculation that actual young are not produced until the fourth or fifth year. By mid-May the females have laid their clutches of 1 to 3, rarely 4, brown-spotted eggs (some of which have already hatched). The incubation period is 28 days. The young remain in the nest about 8 weeks — this period may vary by several days depending on the number of young in the nest and how much food the parents are able to provide. After learning to fly, they stay near the nest for several more weeks playing with the parents in flying exercises and learning to fish. They require no help from the parents as they gain their hunting skills and are completely on their own by summer's end.

This past summer marks the fifth year the Fish and Wildlife Service has carried on its osprey nest check program at Mattamuskeet Refuge. The banding phase was added in 1974 in hopes of learning more about their migratory movements. Two nest checks are made each summer — one in mid-May and another in mid to late June.

The first check allows biologists to compile the basic data needed to calculate the fish hawk's nesting success. Old nests are checked for rebuilding efforts and new nests are added to the location map. The number of adults (as nesting pairs or singles) and the number of eggs and/or young in each nest are counted.

The second check provides the final information which allows the biologist to gain a reasonable idea of what kind of nesting success the ospreys will enjoy that year. Ospreys raise one brood per season; a second nesting attempt may be made if the first clutch is destroyed early in the cycle. Virtually all viable eggs have hatched by the last week of June.

A check at this time will reveal which nests have produced young, which nests had eggs or young but are now empty or destroyed, and how many nestlings have hatched and/or survived since the May check. Second-year birds may build or occupy nests but produce no young; this occurrence will show up in the June check as will false (frustration) nests constructed by older adults. Only those nests occupied by a nesting pair can be used in calculating success — using the number of nest sites without regard for parental occupation will bias the results.

The young ospreys are banded during the June check. Although most are fully fledged by this time, the majority still cannot fly and can be taken from the nest to be fitted with a metal leg band. The bands are inscribed with a number which can be traced on recovery to a record of the banding date and location. So far only one osprey banded at Mattamuskeet has been recovered — a bird banded in June 1974 was found late that same year in the Dominican Republic.

Five years is a rather short time to establish trends, but so far the osprey population at Mattamuskeet seems to be holding its own with 30-40 nesting pairs present each summer. This year's May check revealed 56 nest sites, of which 38 were occupied. These 38 nests contained 44 eggs and 43 young, or 87 potential adults. The June check showed 55 young of various ages and one viable egg. About 50 percent of the nestlings usually survive the fledging period and leave the nest, but this year nesting success was considerably better than average: 53 of the 87-May potential survived for a nesting success of 61 percent.

Mattamuskeet is unique in that all active osprey nests are found in the small cypress trees which ring much of the lake's shore. The nests occupy most of the tree's crown and are rarely more than 15 feet above the water's surface. One nest tree was heeled over at better than 45 degrees from vertical, the weight of the nest pushing it closer to a watery demise each year. The majority of ospreys are found at the western end of the lake; the water is a bit deeper there and two large stands of native millfoil (*Myriophyllum heterophyllum*) provide good fish cover.

Helicopter Big Help

This year's check marks the first time a helicopter was used in the project. A small boat and outboard motor had been used previously to move from nest to nest. There are several problems in using a boat for this project. First is the sheer size of the lake — 18 miles long and 6 wide, with over 40 miles of shoreline providing good osprey habitat. The second is that the lake is at its shallowest stage in the summer; the boat must be carried in many places where there is not enough water to float it (this summer the lake was at its lowest level in five years — a boat would have been completely impractical). The submerged cypress stumps present a hazard to the boat and motor. It is quite easy to miss new nests. Time is also a factor — it takes two men three full days to do each check.

The helicopter arrives on the scene as an invaluable asset. Fitted with pontoons, it can land anywhere, needing only sufficient clearance for its rotors. Nests are much easier to spot from the air, and if a nest is empty the biologist can move on without having to land. Should young be present, he lands, uses a ladder to climb the nest, bands the critter, and flies on to the next nest. It is gloriously simple — all nests on the refuge can be checked in less than 4 hours and all the young can be banded in a single day.

I had heard about the problems of using a boat, so I was mighty glad to be invited along in the helicopter. However, the first time we landed I found there just might be some excitement after all. I stood there in two feet of water, snapping pictures as Al and Otto banded the young birds. Then I tried to move — but my feet had sunk over my ankles in the sticky gork on the bottom. No problem, I thought, I'll just reach back here, grab hold of the chopper's pontoon, and extricate

myself . . . ohoh. The helicopter had drifted about ten feet away, tugging at the anchor Al had thrown out. Splash.

Thus when we landed I kept a firm grip on the pontoon while I tested the bottom. This time it was nice and solid. Managing to reach the nest without adding a new layer of mud to my rear, I was fascinated by the behavior of the two nestlings. They were fully fledged and would be making their maiden flight within a few days. Now they lay motionless on the flat platform of sticks, their coloration blending perfectly with the nest. But when Otto picked up the first one, it immediately began fighting. It sank its talons into Otto's gloved hand and showed a strong desire to bite Al's unprotected fingers as he locked the shiny band around one leg. When Otto placed it back on the nest it sat there, feathers ruffled, glowering at us as we performed the same operation on its indignant sibling. When the second one was returned, the first stood at its full height, stretched its wings, and again tried to make use of that formidable-looking black bill. Their parents were

U.S. Fish and Wildlife Service Biologist Otto Florschutz uses gloves to hold this seven-week old osprey as pilot Al Noltemeier carefully fits the metal leg band. Young osprey of different ages may be found in the same nest (right). The birds are peaceful and seldom fight among themselves.

overhead, screaming and making steep dives at us but never coming too close.

Lots of Cypress

The next nest was located in an area where the lake bed was heavily littered with fallen cypress trunks. They were invisible from the lake shore, but from the air they looked like handfuls of toothpicks scattered across the bottom. Cypress resists decay even when submerged; none of us could even hazard a guess at how old these were — but they were ancient. The nest held two young which were banded without incident.

Flying along at 150 feet it was easy to see why using a boat in this project would be such a pain. There were hundreds of cypress trees as far as I could see along the north shore, and mud flats were visible in several places.

The next two nests on the list were empty. We just flew by, looked in, and went on. I thought the sixth nest was empty also, but Otto signaled Al to circle closer. He had spotted one small bird huddled by the edge of the nest. Both parents began diving and charging the helicopter as we landed, coming closer than any of the previous ones. Several sparrows flew from the lower branches of the nest as we sloshed toward it. The osprey is peaceful and tolerant toward its neighbors, strictly minding its own business. Sparrows often nest in the lower portions of the osprey's aerie; only such species as may harm its young are driven from the vicinity.

The adults continued their displays as Otto placed the ladder against the nest and began to climb. Inside lay a nestling only a few days old, barely covered with down and already panting under the hot sun. At this stage the creature is too weak to lift its head and is very susceptible to direct sunlight; the mother will stand with half-open wings to provide the youngster some shade. This bird was too small to band and was added to a list of six others which were also very young.

I wanted a picture of the little hawk, so I hurriedly clambered up the ladder. The bird was panting rapidly and we wanted to leave as quickly as possible so the female could return to shelter it. As I focused the camera I heard, or felt, something rush close by over my head. The men standing in the water below gasped and chuckled. Heading back toward the helicopter, Otto said one of the adults had dived at me, missing by only a few feet.

If one is going to tinker around an osprey's nest, one must expect to be attacked occasionally. Some ospreys, like people, are more aggressive than others. Most are content to fly about and scream from a safe distance; others will dive as this one did. They seldom actually strike a human intruder, but it does happen. Size seems to make little difference, as evidenced in the opening paragraph of this story. We were charged again later in the day by another osprey; it darted by under the chopper less than 50 feet away.

By lunch we had finished the 13 nests scheduled for the morning, completing the 1977 check.

Soon afterward Otto and Al took off again, heading back to Washington, North Carolina, where I would meet with them later in the day to talk more about the project. I felt kind of trapped as I stood in the stifling heat and watched them disappear. A pair of doves darted past and landed in a pine tree by the canal; far out over the lake I could see an osprey wheeling against the sky. I smiled as I turned away. For awhile there I had wings too.

What My Hunting Records Tell Me

Story and Photos by Bob Gooch Troy, Virginia

I remember it now as clearly as if it had occurred yesterday — that swerving, speeding mourning dove skirting the tall sycamores along the river as it headed for the river bottom cornfield. I tightened my grip on the old Winchester Model 24 double. The bird was going to buzz my stand!

Suddenly it was in range — but ever so briefly.

Desperately I groped for the speeding bird, and missed with both barrels!

The date was October 17, 1946, my hunting log tells me. It also tells me the afternoon was cool and clear, and that I was hunting doves with several companions over a freshly harvested river bottom cornfield in Albemarle County, Va.

Those brief notes also tell me my game harvest that day was unimpressive. While they tell me little more, they do open the gates to a flood of happy memories. That bright afternoon is suddenly vividly clear.

I was back in school after an interruption for Marine Corps service in World War II and more attuned to rifle shooting than handling a scattergun. My shooting that afternoon attested to that.

I had arrived home from the Pacific the previous January, too late to do little more than catch the tail end of the 1945-46 hunting season. Now I was looking forward to a full season of hunting.

One of my fellow students was a local lad whose father owned the big river farm we were hunting. He and I with several other students made many trips to that dove field that golden postwar autumn.

My shooting improved steadily, and toward the end of the season my record began to look respectable.

Those sketchy notes also bring back fond memories of that old Model 24 Winchester, a fine gun that had seen wartime service in special services. I picked it up for a song, but lost it years later when my boat capsized on a duck hunting trip.

Like more professional journalists, I make many notes, and have done so for years. My hunting log is one of my more elaborate set of notes. Entries in it go back to 1946, and serve as a record of all of my hunting trips. It has become a permanent record of such things as places I have hunted, dates, dogs, game bagged, cripples, gun or bow used, weather conditions, ammunition, cover, time of day, companions, hunting methods, and miscellaneous data in a catch-all remarks column.

There are various hunting logs on the market, and they are advertised in the major outdoor magazines, but the hunter can devise his own. At various times I have used both. The hunter who plans his own can include space for the particular kind of information he wants to record.

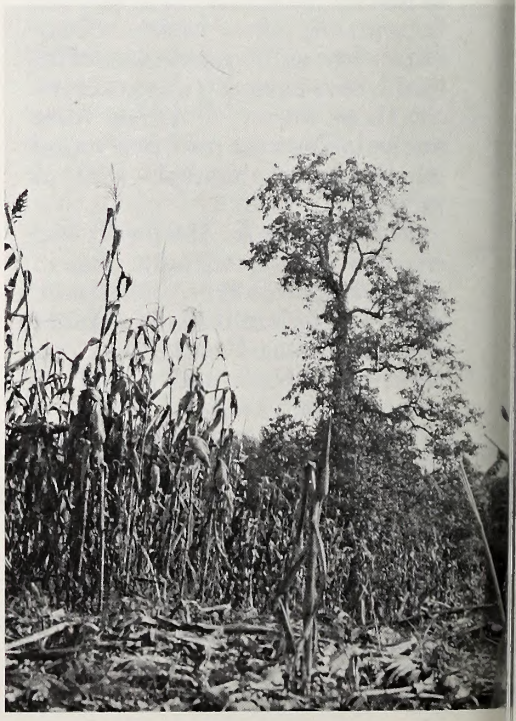
While my hunting records tell me many things and are a constant source of pleasure, the memories they revive may well be their major fruit.

But there are more practical considerations.

For example, the record of that October 1946 dove hunt tells me the shooting was best between 4 and 6 P.M. Over the years that pattern has held well. Most experienced dove hunters agree that doves fly best after mid-afternoon.

The notes of that October trip also tell me that we found a lot of doves over that river bottom corn field, and that is another pattern that has pointed the way to some fine hunting. Doves like river botton cornfields. They furnish them food, sand bars for grit, the river for water, and usually

Keeping detailed records of hunting trips and reviewing them from time to time, is certainly one way of reliving these experiences and they may even make the next trip more successful.



nearby wooded upland for resting and roosting.

My shooting was pretty poor that October day. Now I know why. A long lay off had something to do with it, but that old Winchester with its long, heavy, 30-inch barrel did not help. I later switched to a light 26-inch barrel field piece and my score on doves improved considerably.

I flip a page and there before me is November 26, 1946, probably the Thanksgiving break from classes. My late Dad and I hunted bobwhite quail that bright November morning. My records tell me it was warm and clear, and the trip comes into focus.

We hunted behind Dad's fine little English setter, Lady, and she did her usual superb job. We found the birds in the lespedeza fields, but they sought the woods when flushed my log tells me. In the years since, I have found many birds in lespedeza fields but this kind of cover is fading fast. We had to hunt the woods for the singles — and I still do.

My records tell me Dad, an experienced bird hunter and a crack wingshot, did well, but I was still learning. I bagged a lone quail and potted a rabbit when the dog wasn't looking. One of my problems was the heavy Winchester. It was hardly a field piece, but this was post-World War II and guns were as scarce as the proverbial hen's teeth.

From my log I notice that Lady was still going strong in 1948.

But let's leave the 1940's.

November 19, 1956, my records tell me, I was hunting ducks on the James River in Virginia with a couple of waterfowling brothers. My notes also tell me we were in the blind early, well before the first light. According to my log we had been in the same blind two weeks earlier, and our bag included the usual river favorites — mallards, black ducks and woodies. My old Model 24 Winchester was still doing yeoman duty and more appropriate for the duck blind than the quail fields. It patterned those size 4 magnum loads well. The James River duck shooting has changed little over the 20 years since.

By the early 1960's I was shooting a light Ithaca 16 gauge repeater, with bored improved cylinder and ideal for upland hunting. On January 7, 1961, it helped my hunting party bag six rabbits. The day was clear and crisp. My father-in-law had retired and acquired a fine pack of little beagle hounds. He spent many happy days afield with them, and I joined him as often as I could. During the mid-1960's we spent many hours chasing cottontails.

Reviewing the records of those hunts tells me a few things about rabbits. My father-in-law insisted there was no need to get out at dawn for bunnies, and a study of those fine hunts show that our success was most pronounced between 9 a.m. and noon. Occasionally we hunted in the afternoon and took our game early.

Squirrels, on the other hand, are dawn and dusk game, and a review of my success with these little gamesters confirms this. Squirrels, too, like warm, bright days, but cloudy ones with a light rain are also good — if the records of my hunts are typical.

I feel the true value of such records is the fond memories they revive, the opportunity to thumb through them reliving those memorable hunts, and a chance to study your growth as a hunter.

Still, there is a more practical value in such records, one that can help the hunter become more proficient. They establish patterns.

Assuming the hunter's records are complete enough, he can gather from them such information as the kind of weather that most often produced good squirrel bags, the kind of habitat that produced the best rabbit hunting, the months that offered the best duck hunting, and the best months for quail hunting. Was it best in early November as the season opened, or were the late winter months best?

Old time hunters, those who relied more upon their memories than a note pad to record such information, built their rich hunting lore by mentally recording such patterns.

They were keen observers of wildlife. They had to be to succeed. The modern hunter can turn to outdoor magazines, books, lectures, and the experiences of others to acquire the lore the old timers accumulated over a lifetime.

The modern hunter can also build his own hunting lore, establish his patterns, and use the information to further his own hunting efforts. A hunting log to record such data is helpful.

It is true many of these patterns and this kind of information is readily available, but the hunter will derive much satisfaction from confirming such information by his own record keeping.

As I review my own records and compare those of the mid-70's with those of the mid-40's I get a lot of satisfaction from the realization that my game bags tend to be fuller now than they were 30 years ago.

Why?

For one thing I am undoubtedly a better hunter today than I was then. Unlike athletes, hunters can improve with age. But more important, my own success tells me game is just as abundant generally, and in some cases is more abundant. Modern game management is doing a good job of providing game for today's hunters.

And oh yes. Those records also tell me my penmanship was much better in 1946 than it is three decades later.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Mourning Dove Season Announced

The season on mourning doves will be split as in the past; and the first half will open at noon on September 3, 1977, and close October 15, 1977. The second half of the split season on doves will open at noon December 19, 1977, and close January 14, 1978. The daily bag limit will be 12 doves.

HIGH TIDES - TIMES AND ELEVATIONS (in feet) - SOUTHPORT, N. C.

September			October			November		
Date	Time*	Elevation	Date	Time	Elevation	Date	Time	Elevation
13	7:46 PM	5.0	12	7:06 AM	5.3	9	5:52 AM	5.1
14	8:15 AM	5.0	12	7:20 PM	5.0	10	6:42 AM	5.4
15	9:00 AM	5.1	13	7:53 AM	5.5	11	7:34 AM	5.7
16	9:48 AM	5.2	14	8:43 AM	5.6	12	8:27 AM	5.8
17	10:39 AM	5.1	15	9:34 AM	5.6	14	10:14 AM	5.5
22	3:55 PM	5.0	17	11:26 AM	5.3	15	11:11 AM	5.3
23	4:54 PM	5.1	18	12:27 PM	5.1	16	12:09 PM	5.0
24	5:46 PM	5.2	25	6:33 AM	5.1			
26	6:55 AM	5.0	26	7:15 AM	5.1			
26	7:20 PM	5.1	27	7:53 AM	5.1			
27	7:37 AM	5.1	28	8:32 AM	5.0			
28	8:21 AM	5.1						
29	9:00 AM	5.0						

*All times are expressed as Eastern Standard Time.

The season on rails and gallinules will be September 1, 1977, through November 9,1977.

Public Hearings on 1978 Fishing Regulations Set

Public hearings were also scheduled to air proposed changes in the fishing regulations for the 1978 season. The hearings will be at 7:30 p.m. at the following locations:

September 26, 1977	Asheville	Buncombe County Courthouse
September 27, 1977	Salisbury	Rowan County Courthouse
September 28, 1977	Greenville	Pitt County Courthouse

Stem to Stern

BY ED JENKINS

It's wholesome, clean, and fun. It's a throwback to our ancestors' lifestyle when the most advanced technology was nature. It's contrary to today's noisy, smog-filled society. Many long to do it while many others do it.

All it takes is a body of water, a small boat with a white sheet and a little sigh from an old Greek god from above and you guessed it, we're sailing.

According to the Let's Go Boating Committee, whose main interest is to get people out of the house and onto the water, sailing isn't as hard as it looks. Skeptics struggle to play down the idea of lying across a sailboard, running downwind or hopping aboard a sloop and first-mating a Sunday afternoon cruise.

Their reasoning is usually that it takes some sort of inherent talent to skipper a sailboat. Not so. Sailing a craft is rather easy and quite a lot of fun.

A sport for all ages, sailing can satisfy the daring desire of a 13-year old or the leadership qualities of a 60-year old. Girls, too, are just as qualified to man (woman?) the masts as anyone of the opposite sex.

There are a few things to know about how a sailboat works. They are easy to learn and even easier to put into practice.

How does a sailboat sail? There's nothing about the powers of nature which you don't already know that are responsible for sliding a boat across the water. First, if a boat is sailing downwind, or with the wind blowing from behind, the wind naturally pushes it along. In order to take full advantage of this, the sail is positioned, or trimmed, so as to present its maximum resistance to the wind.

present its maximum resistance to the wind. Translated into mathematical terms, the sails are set at right angles to the wind. Don't worry yet which direction the boat is moving.

Secondly, when sailing against the wind, the sail now becomes an airfoil similar to a wing on an airplane. The force of the wind puts pressure on the windward side and pulls on the downward side due to the vacuum created. The angle of the sail should be about 45 degrees from the wind.

When you are sailing across the wind, or on reach, both pressures are at work simultaneously, accelerating the boat to its fastest speed. This really gets the old adrenalin in motion.

Quite logically, no boat can sail directly into the wind or ride higher than 45 degrees to either side of the wind direction.

There is a certain amount of resistance which must be overcome before the hull will move forward in the water. When wind pressure is strong enough to overcome the struggle with the hull, you sail. Except with the wind directly from behind, there will always be pressure sideways on the hull. But a permanent projection from the bottom of the hull, called a keel, prevents side slippage to the left or right. In many craft, a centerboard is used instead of a keel. This can be raised whenever necessary to go into shallow water.

Completing the ingredients for a sailboat is the rudder which permits directional control of the boat. The rudder is simply a movable vane which uses the pressure on its surface to keep the boat in a straight line or to change direction.

That's it. You've just learned the basics you have to know about sailing. Of course, just reading never made a person great with boats. It takes practice — but that's the fun part! If you're lucky, your local Red Cross Chapter or city recreation department may conduct sailing classes. If not, sign up to crew on a friend's boat and learn from him.

The summer may be about over, but there's a windy, wonderful, watery world waiting for you right now.

Whether you're skippering a 70-foot yacht, or something more like this 14½ foot Dagger, sailing is a unique water experience. Want to try it?

Carolina Beach State Park

By Marcia Constantino

Tidal marshlands, sand dunes, pine savannahs, and tall grassland-bog regions are Atlantic Coastal habitats found at Carolina Beach State Park. Visitors can observe a diversity of plant and animal life along four to five miles of trails winding throughout the park. A short interpretive trail leads across most of the park's "coastal communities," including the peat bog which supports at least six species of insectivorous (insect-eating) plants. Among them is the Venus' fly-trap, described by Darwin as "the most wonderful plant in the world".

In addition to opportunities for nature study and appreciation, there are recreational facilities for public enjoyment. Camping, fishing, boating, hiking, and picnicking are popular activities at Carolina Beach State Park.

Covering 1,732 acres, the park is bordered on the west by the Cape Fear River and on the north by Snow's Cut, both continuous links in the intracoastal waterway. It is 15 miles south of Wilmington off US 421. Roughly 1,200 acres of the Sunny Point Buffer Zone, including a large sand dune called the Sugar Loaf, are leased by the state from the United States Army. Sugar Loaf, at 110 feet tall, is the highest sand dune on the North Carolina coast between Wilmington and the South Carolina border.

Fly-Trap Trail

The half-mile Fly-Trap Trail encircles a low lying bog and crosses through desert-like habitats and grassland regions. Permanent markers along this self-guiding trail bear descriptions of over 30 trees, shrubs, and flowering plants associated with the various habitats represented. Boardwalks over wet areas allow for closer investigation of this unique environment.

Because the bog soils lack nitrogen at certain times of the year, some plants have evolved to supplement their diet by attracting, trapping, and eating insects. The six insectivorous plants represented at the park are the parrot and trumpet pitcher plants, yellow butterwort, red sundew, terrestrial bladderwort, and the Venus' fly-trap, which grows within a 75-mile radius of Wilmington and nowhere else in the world. All are protected species.

Insects crawling into the pitcher plants fall into a liquid and drown. The leaves of the butterwort have a waxy surface which traps insects. Hapless bugs are also attracted to the sticky, glistening droplets on the leaves of the red sundew. The tiny sac-like bladders of the terrestrial bladderwort trap soil-dwelling insects underground. The hinged leaves of the Venus' fly-trap close like a scallop shell after an insect "twice" touches the tiny trigger hairs inside. Juices secreted by these plants slowly digest the insects, allowing nourishment to be absorbed directly through the leaves.

The sand dune community (far left, opposite page) is but one of the several habitat types present in the Park. The Fly-Trap Trail (left) provides a fine opportunity to observe plants such as its namesake, the Venus' fly-trap (right). The new marina (above) makes the Park even more attractive to the boater.

As the trail winds away from the bog, the soil becomes coarse and dry. Plants growing on this slightly higher ground have developed special ways of dealing with their arid environment. Sand spikemoss copes with severe dryness by simply drying up. After a rain it quickly resurrects until the soil has again lost its moisture. The prickly pear cactus maintains a water reserve in its thick fleshy stems.

Visitors passing through the grassland-savannah community note its similarity to the prairies of the western United States. Large grassland areas, once quite extensive in eastern North Carolina, have been lost to agriculture and development. A common grass of the savannah is wire grass with narrow folded leaves and woody cells that enable it to conserve moisture.

A leisurely walk through the Fly-Trap Trail takes 30 to 45 minutes.

Hikers are welcome to explore other trails in the park. Many trails follow the routes of old roads winding through the scrub. The Pocosin-Sandhills Trail passes by a lily pond and a cypress pond. By following the river, hikers can explore the tidal marsh-Cape Fear River shoreline zones for a closer look at estuarine communities and then walk to the top of Sugar Loaf. Abundant bird life in the park is represented primarily by seasonal songbirds and woodpeckers. Shorebirds, terns and gulls, wheel overhead, and an occasional osprey or "fish hawk" is sighted hovering over water. The brown pelican, an endangered species, has also been identified at the park.

During the summer months seasonal naturalists conduct early bird walks and seashore excursions at scheduled times on weekdays. Guided walks along the river shore to Sugar Loaf and on the Pocosin-Sandhills Trail are scheduled for Saturday and Sunday. Slide shows are presented at the campground on Saturday nights.

Nature hikes can be scheduled with the park's full-time naturalist from September through May. Interested groups and individuals should call several days in advance at (919) 458-8207.

A new marina with launching ramp, floating docks, and fueling facilities has made boating and fishing more popular than ever at Carolina Beach State Park. Thirty boat slips, which can accommodate boats up to 40 feet in length, can be rented by the day, week, and month. Each docking space has hookups for electricity and fresh water. Twenty-four hour surveillance by the state affords protection for boats docked at the marina. Inquiries about fees and slip rentals should be directed to the marina office.

Numerous species of saltwater game fish are found in waters near the park. Spot, flounder, croaker and whiting are fairly abundant. In season, blues and speckled trout provide the sportsman with top angling and good eating. Those fortunate enough to land a hefty channel bass may reach what many consider the pinnacle of good fishing.

The spacious, wooded family campground has 83 tent/trailer sites, but there are no hookups for trailers. Each site has a picnic table and grill. Drinking water, washhouses with hot showers, and flush toilets are accessible to campers. A dumping station for park users stands near the campground exit. The fee for a regular campsite is $3.50 a day for each family or group of four individuals. Reservations for campsites can be made for a minimum of three days and a maximum of two weeks. Unreserved campsites are assigned on a first-come basis.

A quiet day-use area shaded by oaks and maples has thirty picnic tables, grills, restrooms, and water fountains.

Swimming is prohibited throughout the park because of strong, fast currents in the waterway. However, the city of Carolina Beach just one mile south-

Continued on page 27

PHOTO BY THE AUTHOR

HYDE COUNTY AIRPORT

by Gary Stevenson

Imagine a remote, low lying county bordered on two sides by miles of brackish water, situated 60 miles from the nearest city. The area has almost no industry and its total population is around 5500 people. The summer sun beats down on tens of thousands of acres of corn, soybeans, timberland, and lush green-brown swamp; the temperature is in the 90's and the humidity runs a close race for a hundred. A tractor drags a cloud of dust behind it, covering its driver in a layer of gray. In winter, a cold north wind whistles across the now empty fields, dotted here and there by flocks of waterfowl feeding on the combine's leavings. The morning and evening skies are criss-crossed by the geese, swans, and ducks as they move between fields and water, their calls continuous on the wind.

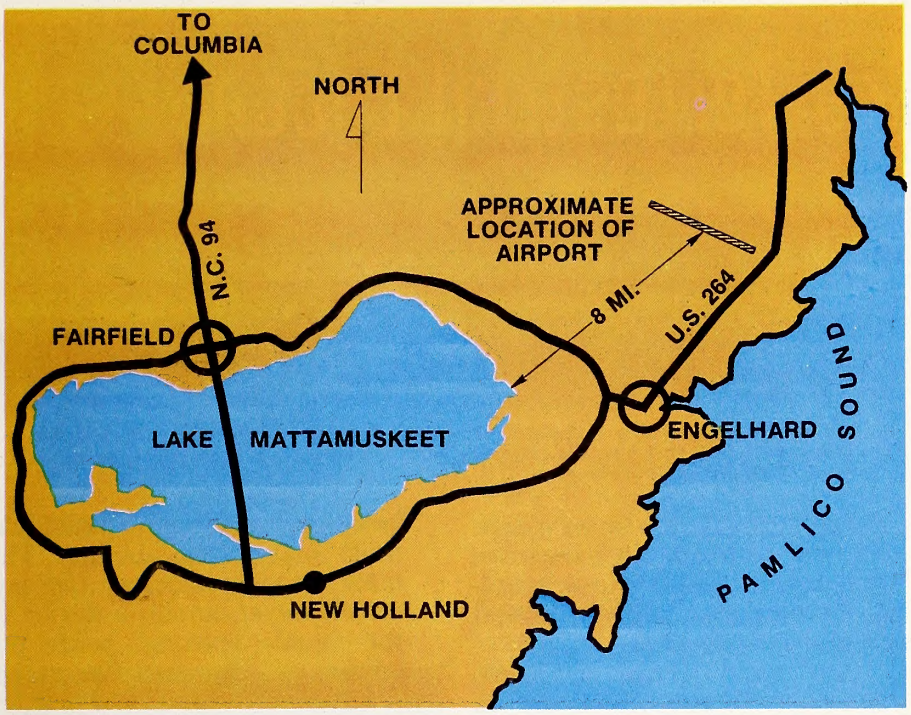
Now let's clear about 400 acres of this land and build a $2 million airport on it.

Sound unlikely? A lot of folks seem to think so, but this is what is happening in coastal North Carolina's Hyde County. Area leaders hope the airport, capable of landing small jets, will draw industry and money to the county. However, many residents question the need for the facility and its effect on their taxes. There is also a question as to how it will affect nearby Mattamuskeet and Swanquarter National Wildlife Refuges.

Idea Not New

The idea of an airport for Hyde County has been discussed for a number of years, but nothing was done about it until late 1976. At that time Pamlico Properties, a subsidiary of Georgia Timberlands, Inc., donated a 385-acre tract of land to the county as a building site, and the project was begun under the auspices of the Federal Aviation Administration. Later the county applied for funding through the Economic Development Administration, which granted $2.08 million for the project. Officials say that no county monies will be involved, save for the $5,000 federal fund application fee. The land was donated, federal money is covering the construction costs, and part of the land is to be leased for farming, which will cover maintenance expenses.

Even if the airport does not place a financial burden on the county, its benefits will still be questionable. Georgia Timberlands stands as the only firm to gain from the facility at the present time. They hope to



The proximity of the proposed airport to Lake Mattamuskeet is shown on this map of the area. What effects, if any, this airport will have on the waterfowl and other Wildlife near the Lake (left), remains to be seen.

develop agriculture, industry, and recreation in the area, giving rise to rumors that taxpayers' money is being used to subsidize private business. The idea that the airport may provide jobs appears good at first glance, but it seems that it will be operated by a private company when finished and virtually all construction labor is being imported. The airport may draw new industry and new employment opportunities — but then again it may not. The building site is located just three miles south of a military restricted airspace area, and another restricted zone lies south of Swanquarter. In view of these observations, it is easy to see why most area residents are wary of the project and some are downright opposed to it.

Readers of this magazine will be especially interested in the airport's possible effects on wildlife.

The airport's 4800-foot runway is located about 8 miles northeast of the eastern boundary of Mattamuskeet Refuge. Large numbers of Canada geese and whistling swans rest at the east end of the refuge during the winter and often travel some distance north, northeast, and east of the refuge in search of food, creating a potential bird-airstrike hazard. Gulls have caused disastrous crashes at some coastal airports in the past; a swan is four times the size of a gull and presence of the birds should certainly warrant concern on the part of the airport management.

Concern Expressed

Mr. James H. Roberts, refuge manager at Mattamuskeet, is concerned that heavy air traffic over or near the refuge would cause wintering populations of waterfowl to alter their feeding and flight patterns. FAA regulations now request that aircraft not fly lower than 1000 feet over a national wildlife refuge. Mr. Roberts says that it could take two or three years to detect any significant change in the birds' habits, but if any adverse effects are noted he will request more stringent restrictions for the refuge. It should be noted that Mattamuskeet has only recently begun to recover from a serious waterfowl population decline which started in the late 1960's and hit a low point in the 1972-73 season.

One of the most troubling aspects of the Hyde County airport project is the precedent it has set in its licensing procedures. The Economic Development Administration (EDA), which is now funding the project, utilizes procedures that differ from those of the National Environmental Policy Act (NEPA) concerning the licensing of projects which utilize federal funds. The EDA contacts certain federal, state, and local agencies in an abbreviated licensing procedure which does not require an Environmental Impact Statement (EIS) to be circulated to the U.S. Fish and Wildlife Service and other agencies.

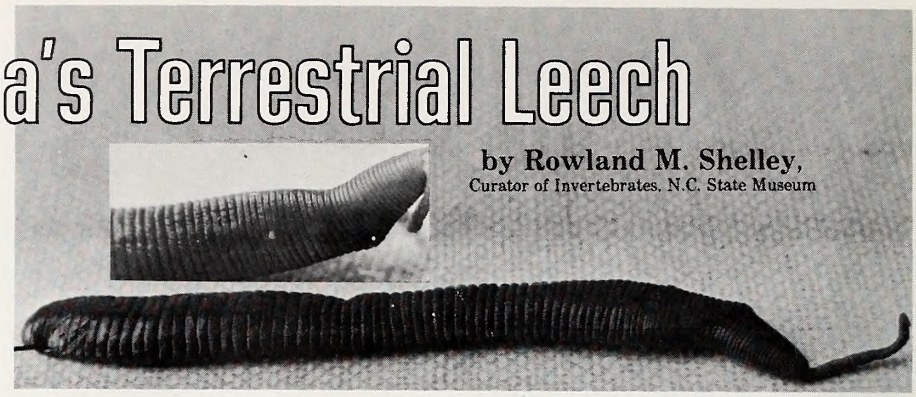
An environmental impact assessment report describing the area being cleared for the airport was prepared; however, the Division of Ecological Services, and the management at Mattamuskeet were all bypassed without consultation on the matter. In fact, many people in these agencies were not aware that the airport was more than a rumor until a newspaper article about it appeared in late May ("Hyde Hopes Airport Will Draw Industry" by Ted Vaden, Raleigh *News and Observer*, Sunday, May 22, 1977). Contrary to the article, a formal EIS was not prepared; it was confusion over this fact which drew the attention of Mattamuskeet, and Ecological Services personnel who subsequently traced the course of events up to the present time.

It is disturbing that a project of this magnitude was started so close to a national wildlife refuge without consulting knowledgeable Fish and Wildlife Service personnel. Since the EDA was not legally bound to file an Environmental Impact Statement under routine NEPA procedures in this case and no wetlands are being directly impacted, the Fish and Wildlife Service has no opportunity for a formal review and comment.

One has to wonder, in view of all the questions posed by the project, why so few people knew anything about it until construction was well under way.

North Carolina's Terrestrial Leech

by Rowland M. Shelley,
Curator of Invertebrates, N.C. State Museum



This is a dorsolateral view of the terrestrial leech showing a portion of a partially eaten earthworm protruding from the anterior sucker. The inset photo is a ventral view of the region of reproductive openings.

If all the aquatic invertebrates of the world, probably none elicit such fear and revulsion as the leeches. Although some species, especially in southeast Asia, are renowned for their bloodsucking (sanguinivorous) habits, their bad reputation as a group is largely undeserved. In the 18th and mid-19th centuries, bleeding or "leeching" was widely practiced in hospitals in Europe (less so in America), but this treatment has disappeared from the civilized world. In nature some leeches are sanguinivorous and parasitize fish, frogs, turtles, and other vertebrates. Many, however, are scavengers or predators, and feed on aquatic invertebrates such as snails, small insects, and even other leeches.

Leeches are highly specialized worms, related to earthworms and a group of marine worms called polychaets. These invertebrates are collectively called annelids, and leeches are frequently referred to by their scientific name, the Hirudinea. As with all annelids, the body of a leech is composed of many rings (annuli) which are clearly visible to the unaided eye. The external surface may be smooth or covered with tubercles or papillae. Varying numbers of eyes are located on the anteriormost segments, but they are only photoreceptors and cannot form images. The most obvious feature of the Hirudinea is a pair of suckers, one at either end. The mouth opens through the anterior or oral sucker, which functions both in feeding and attachment. The caudal sucker is strictly an adhesive disc and the principal attachment organ. The body wall is very muscular, and leeches can greatly extend, contract, and twist their bodies.

Most leeches occur in shallow fresh-water habitats where there is little current and sufficient plants and debris to provide concealment. Some species live in the estuaries and oceans, and in the tropics and to a lesser extent the temperate zones, some species have become adapted to terrestrial environments, living in soil and on moist vegetation.

One such terrestrial leech, *Haemopis septagon*, occurs in North Carolina. It inhabits swamps and moist floodplains in the eastern Piedmont and Coastal Plain, and is usually found under or inside partially buried, rotting logs. The species is common in the "Triangle" (Raleigh-Durham-Chapel Hill) region, and is also known from Hertford, Pasquotank, Duplin, and New Hanover counties. A specimen at the U.S. National Museum in Washington, D.C., was collected in March 1924 from "Eyre," North Carolina. No county was given, but this locality may be a misspelling of Eure, Gates County. Outside North Carolina, *H. septagon* is known from near Williamsburg, James City Co., Virginia, and near Plantersville, Georgetown Co., South Carolina.

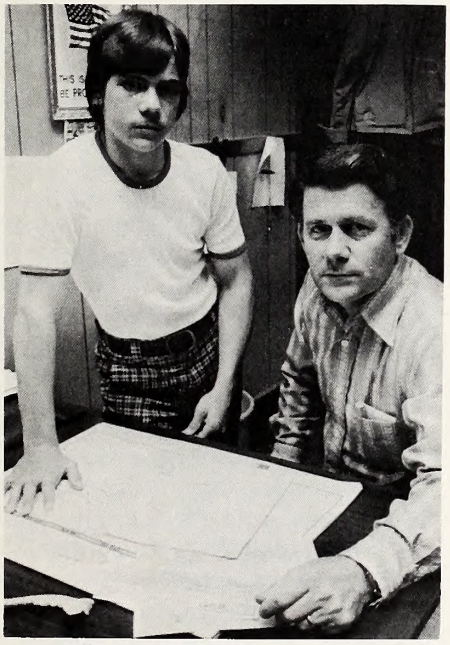
Haemopis septagon is readily identified by its large, flaccid body, which may range up to 6½ inches in length. Dorsally, it is dark olive-green in color with a faint longitudinal middorsal stripe and numerous scattered black flecks. The most characteristic feature, however, is a small, white papilla on the ventral surface, about 1/3 of the way back from the anterior sucker. This structure is the female gonopore, which is the opening of the female reproductive tract. As with all leeches, *H. septagon* is hermaphroditic, and both sexes are present in a single individual. Self-fertilization is impossible, however, and each individual must mate with another. The male gonopore is located approximately seven annuli anterior to the female opening, hence the origin of the specific name, "septagon."

Nothing is known about the life-history of the species, but juveniles have been encountered in April. The primary food source appears to be large earthworms, which inhabit the same environments and are frequently regurgitated when the leeches are being preserved.

Haemopis septagon was only discovered in 1972 and is thus one of the newest additions to the known fauna of North Carolina. It is the second terrestrial leech to be reported from the United States, the other, *Haemopis terrestris*, having been known since 1890. The latter occupies essentially the same habitats as the Carolina species, and occurs in the Mississippi Valley from Illinois to Louisiana and along the Gulf Coast to the vicinity of Gainesville, Florida. In addition to terrestrial habits, the two species possess anatomical similarities that suggest that they were derived from a common ancestor. Unfortunately, no land leeches have been collected in either Georgia or South Carolina, where one or both species may occur, but it seems reasonable to suggest that their ranges may be divided by the Savannah River. Should a specimen of either be encountered in these areas by future investigators, it may be collected by hand, for both terrestrial leeches are completely harmless to man.

Hunter Safety Essay Winner

By Johnny Merritt
Staff Writer
"The Sampson Independent"



Hunter safety essay winner Billy Inman and Plain View (Dunn, N.C.) school Principal Gene Asby.

An eighth grade student at Plain View Elementary School, Dunn, N.C., has been named as the Marlin Hunter Safety Essay Contest Junior winner for North Carolina.

Judged tops in the state was Billy Inman, son of Mr. and Mrs. William (Bill) Inman of Route 5, Dunn.

Young Inman received a $50 gift certificate for the winning entry and moved to national competition.

Inman was instructed in a hunter safety course by Plain View Principal Gene Asby who was also given a $50 gift certificate. Asby donated the certificate to Inman, one of several youngsters at the school to complete the hunter safety course.

The essay contest is sponsored by the Marlin Firearms Company of Providence, R.I.

Following is the essay which Inman wrote for the contest;

"The most important thing an individual can do to preserve the sport of hunting is to have a wholesome attitude toward all apsects of hunting. Hunting is an essential sport and everyone should take into consideration the importance of hunting.

"A hunter may help preserve the sport of hunting in any of a number of ways. The hunter should be eager to buy his hunting license, knowing that his money will be going toward a useful cause such as the protection of our wildlife.

"I myself feel that this is very good and I do not mind buying my license.

"Also shooting animals out of season is something the hunter should protect against. Coinciding with this is that it is the hunter's duty to report all hunting violations (within reason) to the proper authority.

"A hunter should be a good sportsman and should observe sportsmen in action. By doing this other people may respect you and hunting more.

"An individual should, if he or she hunts, defend their right to the taking of game, but not have an arrogant attitude against those who are against hunting.

"For the people who don't believe in hunting and want it stopped, they should think of it this way. If people didn't hunt animals, they would die a more tragic death by disease. Hunters really help wildlife more than they hurt it. I say this because if some of the animals were not killed off annually they would over-populate and die.

"The hunter, by hunting, keeps the wildlife population in balance.

"Hunting is a healthy and knowledgeable sport. It helps a person clear his mind of everyday troubles and worries. Hunting also in a great sense helps a person get closely to nature. You can learn a lot about the outdoors while hunting.

"So each and every person should in some way help to preserve the sport of hunting, even if they don't hunt themselves.

"Hunting is an honorable and respected sport and should be preserved."

- Letters
- Comments
- This & That

BACK OF THE BOOK

Bluebird Population Increase

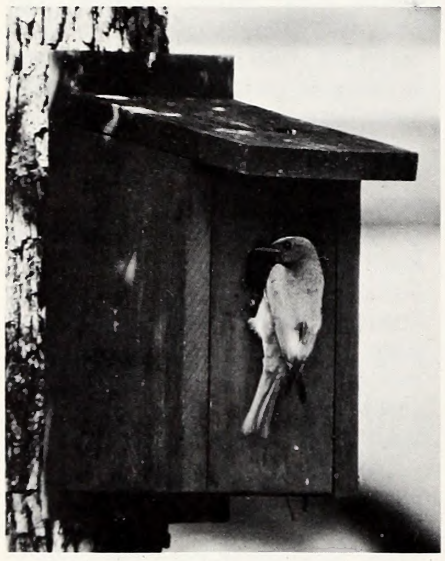
Dear Sir,

Since the beginning of spring and summer, there has been a noticeable increase in the population of bluebirds. In the rural area of Warsaw, everybody I've talked to agrees that there has been a dramatic increase in the bluebird population in Southeastern N.C. Every day they seem to increase more and more. Last year you could hardly find one or two along the roadside. This year, however, I see five or six in a distance of less than a mile. I have built a number of bird houses and feeders and set them up in hope to help preserve the bluebird of North Carolina. It seems to have worked. I send a special thanks to all those who put up bluebird houses and feeders this year and last year. They have helped in a very special way that has brought about the strong comeback of the

bluebird of N.C.

I hope that this letter will touch the hearts of many bird lovers and encourage them to help preserve the bluebird. This can be done by setting out bird houses on fence posts in fields or in your backyard near vines or shrubbery (for cover while feeding young ones). Please take this letter seriously and put out bird boxes next year. It is very rewarding to watch adult birds feeding their young. It is also nice to note that you helped in the struggle to preserve the bluebird. Take it from me and the birds, you'll be glad that you helped save the bluebird, also.

Jerry Boyette
Warsaw



N.C. Wildlife Federation Convention

Raleigh's Royal Villa is the site of this year's N.C. Wildlife Federation Annual Convention September 29 - October 1. Activities during the Convention that will interest the public include the Third Annual Best Wildlife Painting Competition and the Third Annual Big Buck Competition.

National Trails Meeting Set for Sept. 8-10

Chris T. Delaporte, Director of Interior's Bureau of Outdoor Recreation, and William S. Nemec, Chairman of the National Trails Council, jointly announced plans for the Fourth National Trails Symposium, September 8-10, 1977, at Lake Junaluska, in the heart of North Carolina's Great Smoky Mountains.

New strategies for authorizing and funding Federal, State, and regional trails, along with an action-oriented discussion on future development of the National Trails System, will be among the highlights.

For detailed information write: Doris B. Hammett, M.D., 104 Broadview Road, Waynesville, N.C. 28786; or contact the Southeast Regional Office, Bureau of Outdoor Recreation, 148 International Boulevard, Atlanta, Ga., 30303.

1977 WILDLIFE ART EXHIBIT ANNOUNCED

The Wake County Wildlife Club recently announced the 1977 Wildlife Art Exhibit scheduled for early December in Raleigh's North Hills Mall. The exhibit is open to regional artists as well as North Carolinians. Forty-three artists entered over a hundred of their works in 1976 with many more entries expected this year.

The purchase award program is expected to accelerate this year with several banks and other organizations participating. Artists are urged to prepare works for sale (20 percent of the sale price will go to a scholarship fund of the Wake County Wildlife Club) although the artist need not remain with his works since club members will handle all sales. Sales last year totaled nearly $4,500. Details of exact dates and times of this show will be announced soon, but further information can be obtained from Show Chairman Rex Schmidt, 3700 Trenton Road, Raleigh, N.C. 27607. All artists are encouraged to participate.

Mid-Atlantic Waterfowl Festival

Wood carvers, collectors, wildlife art enthusiasts, and just anyone interested in the fascinating world of waterfowl will enjoy the Mid-Atlantic Waterfowl Festival to be held September 16th through the 18th. Sponsored by the Black Bay Wildfowl Guild, the event will be held at the Virginia Beach Convention Center. Nationally known waterfowl artists and decoy makers will be featured, plus many significant collections of antique and contemporary wildfowl decoys. The Convention Center is located at 19th Street and Pacific Avenue in Virginia Beach, Virginia. For further information, contact Tom O'Connor, Director, Mid-Atlantic Waterfowl Festival, PO Box 651, Virginia Beach, Virginia 23451.

Gov. James B. Hunt, Jr., (left, background) looks on as Secretary of State Thad Eure swears in seven new Wildlife Resources Commission members. Left to right they are: W. Stanford White, Edward Renfrow, Woodrow W. Price, Lee L. Powers, J. Robert Gordon, Polie W. Cloninger, Jr., and Eddie Bridges.

New officers elected by the Wildlife Resources Commission at its July 28 meeting are J. Robert Gordon, Chairman (right) and V. E. "Pete" Wilson, III, Vice-Chairman.

BIG BUCK CONTEST

by Frank Mooney

Most avid big game hunters dream of someday shooting a big buck that scores near the top in the Boone and Crockett record book. A little pre-season dreaming and reliving the romance of past hunts goes along with deer hunting, but you don't have to be a professional big game hunter or guide to attend The Third Annual Big Buck Contest. The contest includes both typical and non-typical classes.

The contest is open to the public and is for everyone to enjoy. The main objectives of the big buck contest are to promote trophy whitetail hunting in North Carolina and to find the first deer in the Tarheel State that will score high enough to make the Boone and Crockett record book. This contest will be held in conjunction with the N.C. Wildlife Federation convention beginning October 1.

You don't have to enter a big buck to attend. Come on out and enjoy the displays that will open at 9:00 a.m. A drawing will be held at 6:00 p.m. for a Remington 30-06 BDL rifle. What better way to start off a deer season than with a new rifle.

Let's go into the rules of the buck contest. Division I — Any deer taken in North Carolina before the 1976 deer season that was not entered in the big buck contest in previous years. Division II — Any deer taken in North Carolina during the 1976 season. Boone and Crockett rules are used to score heads entered. Each division will have a typical and non-typical class. The previous winner scored 169-3/8.

All entries should be in by September 15, 1977. Fee to enter a deer head in the contest is only $5. This includes admission to contest and official scoring of antlers. Some of you nonhunters or hunters might know of a large deer (mounted or unmounted) that might be entered. Please send name, address, phone number, of the lucky hunter to Safari Club International, RFD 1, Box 308-J, Hillsborough, N.C. 27278.

The Third Annual Big Buck contest will be held at the Royal Villa Convention Center, Raleigh N.C. on Saturday, October 1, 1977. For any question that might arise, call Safari Club International at 919-732-8054.

● Bream from page 11

the points. Fish the shelves and overhangs with your gnats. Four or five more fat bluegills for the stringer before dusk is a nice reward.

In fall a special dividend from fishing the late pockets at Lake Wheeler is the elusive shellcracker, a fish not overly given to taking artificials. These redeared sunfish run up to two pounds and fight like miniature tigers. Moreover, it's not beyond reason to expect a two-pound largemouth to strike just before night fall, though a gnat is probably not dependable for holding such a prize. Some might find it convenient to take along a light spinrod, or an alternate flyrig, complete with rocket taper line and bass bugs just in case the yearling mossbacks decide to cooperate.

Taking home a modest number of fish can be a real boon. First off, you don't have to clean so many at any given time. Additionally, if you're planning a fish fry, you'll likely have to go out a couple of times more to stock enough fish to go around.

I like my bream swaddled in egg and cornmeal and deep fried in hot fat. There should be plenty of onion-flavored hushpuppies, and some light, dry wine. Good fish and good companions, they go together, the logical outcome of bright autumnal afternoons spent stalking old copper-nose as he lurks warily in the lee, poised to strike at the very edge of the wind.

● State Park from page 21

east of the park provides lifeguards for ocean swimming within the city limits.

Sugar Loaf

Sugar Loaf, named by explorer William Hilton in 1663, has figured significantly throughout North Carolina's early history. The large dune has been the site of Indian habitation, European colonization, Indian wars, and of a Civil War battle. More recently Sugar Loaf has been the object of misuse by man. Now protected by the state, the dune is no longer littered with trash or abused by off-road vehicles.

Many unknown Indian groups, the first dating before 6,000 B.C., traveled through the Cape Fear area to gather oysters and other shellfish. Early attempts at colonization by the white man failed, and the area remained unsettled until after the Tuscarora Indian wars of 1711-1715. Late in the Civil War Sugar Loaf served as a defensive position during attacks on Fort Fisher, one of four forts at the mouth of the Cape Fear River protecting the blockade-running port of Wilmington. A major battle was fought at Sugar Loaf in February, 1865 after the fall of the fort.

Information on all state parks can be obtained by writing the N.C. Division of Parks and Recreation, Department of Natural Resources and Community Development, P.O. Box 27687, Raleigh, N.C. 27611.

One of the wide varities of plants in the Park is the prickly pear cactus which has adapted to a sandy, dry environment by storing its own water supply in the fleshy stems.

Mountain Sunset

Many of Nature's beauties are fleeting, momentary things which must be observed and enjoyed quickly. Yet they may be succeeded by an even grander event. A golden day may end in a glowing red sunset, to be followed by a velvet, star-filled night.

OOTEN

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Wildlife

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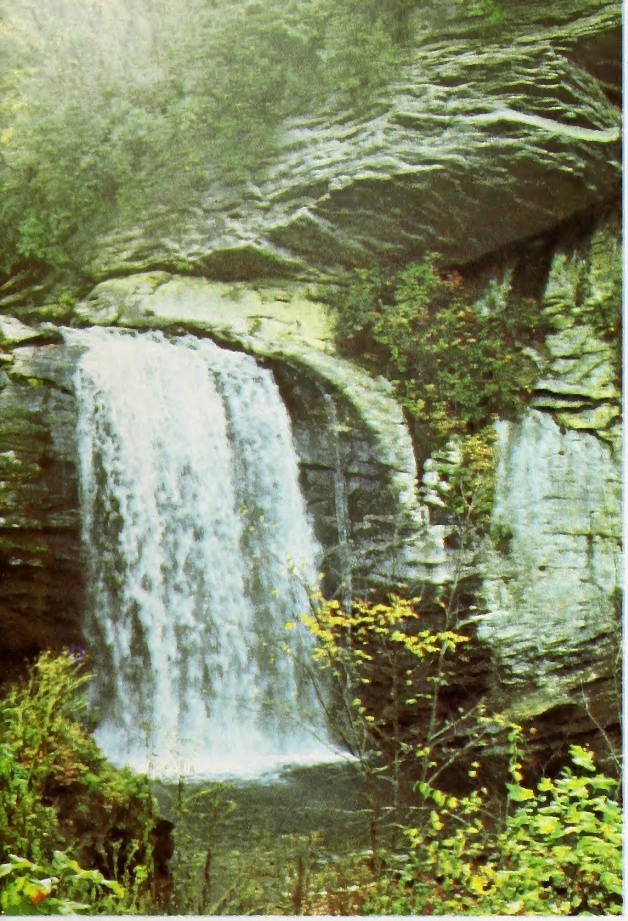
The southern fox squirrel is considerably larger than the more abundant gray squirrel and it's not unusual to have some fox squirrels reach a length of a bit more than two feet. The two pictured on the cover, are examples of the gray or grizzled phase (top) and the black phase. Others have more reddish browns, particularly in the tail. The fox squirrel isn't abundant anywhere in our State, but is more frequently found in the Sandhills and southeastern counties. Painting by Duane Raver.

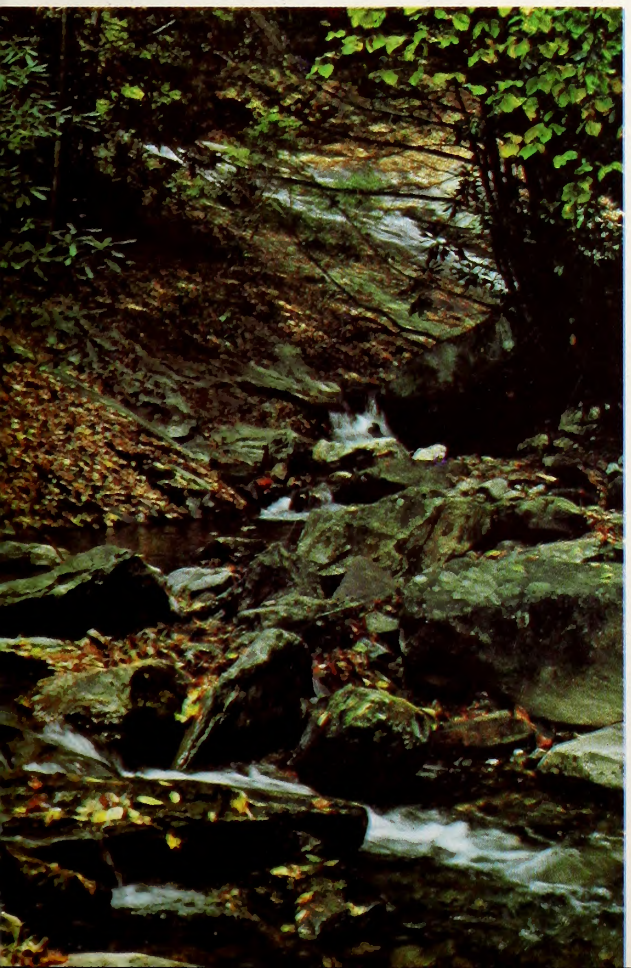
NORTH FORK, FRENCH BROAD RIVER
NEAR ROSMAN

PHOTO BY CURTIS WOOTEN



FALL OF THE YEAR

PHOTOS BY CURTIS WOOTEN



All sections of our State light up with extra brilliance during the fall and these mountain spots are but a few examples. Opposite page, Looking Glass Rock, north of Brevard; above left, Looking Glass Falls; left, Big Mountain Branch, near Rosman; top, Old Mill, Mills River Community; above, "Cradle of Forestry" cabin.

Wildlife Violations:
PROBING A PROBLEM

by Kirk H. Beattie

PHOTOS BY THE AUTHOR

We trudged through the narrow two-foot deep channel that would lead us to our assigned waterfowl blind in the flooded hardwoods. Glancing at my watch I noticed it was 5:45 a.m., still 45 minutes before legal shooting time. We could hear other hunters making their way to assigned blinds. We finally reached a two-acre flooded opening in the woods which was to be our hunting location. We had made it with time to spare; it was still a half hour before legal shooting time. We rested our guns on some stumps surrounding the perimeter of the opening and began placing mallard and pintail decoys over the area. Since there were three of us we decided to triangulate the flooded opening. We had no sooner reached our agreed-upon locations when it happened. Ravenous, noisy, big-breasted mallards began dropping from the sky like B-27's. The acorn-seeking ducks plummeted fearlessly downward. Approximately 200 mallards had settled on our little waterhole in the woods within the time it takes to watch a television commercial. I stood like the Rock of Gibraltar and felt like a young child at Christmas waiting to open his first present.

I daringly glanced at my watch; 6:31 a.m., legal shooting time, was 15 minutes away. I signaled to my wife and fellow hunting companion that we still had 15 minutes to wait. Bang! Bang! Bang, Bang! "Sportsmen" in a nearby blind couldn't resist the temptation and began shooting at the dark objects in the predawn light. The "sportsmen" aparently set off a chain reaction. Hunters in other blinds began firing incessantly at the flocks of mallards. I glanced at my watch; 6:31 a.m. was 13 minutes away. My fellow hunting partners and I dutifully waited for the legal hour to arrive. It was too late. The frightened mallards had long since left the area. They would not be back today.

How would I explain this frustrating, maddening situation to my wife? I had persuaded her to come with me on this cold morning in January. This was to be her first hunting experience. How could I explain the actions of my fellow "sportsmen"? I hesitantly glanced in her direction. She was staring at me with a look of disappointment and disgust. I could not meet her gaze. I methodically began loading the decoys into canvas bags. We would not be back again that year. Our limited time schedule prevented us from enjoying desirable recreational pursuits. Cleveland Amory came close to acquiring a convert that day, my wife. Fortunately, I somehow managed to persuade her that what had happened was a freak occurrence, but I knew better. I reported the early shooting incident to the local

wildlife enforcement officer but a followup investigation was not possible because we were unable to identify the individuals involved. It is essential that sportsmen obtain complete details of a violation incident and, if possible, the identity of the culprits to facilitate an investigation by qualified officers.

Who has the responsibility for controlling the actions of persons who violate wildlife laws and regulations? Your immediate response would probably be "The wildlife enforcement officer." Should we blame the enforcement officer for failing to apprehend most wildlife violators? I think not. You would be hard-pressed to find a group of men more dedicated to their profession. A 16 hour working day is probably the rule rather than the exception among wildlife enforcement officers. The wildlife agent is only human and can cover only a limited amount of terrain. He cannot be everywhere at once.

I think we would agree that there are not enough wildlife officers to control the vast number of wildlife violations that occur. What if it were possible to double the number of wildlife officers in the field? Would that solve the problem? Again, I think not. Studies in Idaho and Maine have indicated that wildlife officers detect approximately one percent of the violations that occur. It would logically follow that a doubling of officers might allow a two percent detection of wildlife violations.

Wildlife law enforcement is a very costly business. The average state wildlife agency spends about a third of its operating budget (the N. C. Wildlife Commission spends around 40 percent) on wildlife law enforcement. Large increases in wildlife officers would drastically cut into funds needed for habitat management, public hunting area acquisition, wildlife research, wildlife education, and endangered species management.

Most popular anti-poaching articles stress that wildlife violations seriously harm wildlife populations. There is some truth to this. Frankly, we do not know what effect most types of violations have on wildlife populations, but we can make professional judgments. Populations of grizzly bears, bighorn sheep, mountain goats, wolverines, and even the California Condor are very unstable. Poaching in any form would seriously threaten the existence of these species.

On the other hand, most small game animals such as cottontail rabbits, bobwhite quail, and mourning doves are very resilient because of their high breeding capacity. Poaching of these animals probably does not result in seriously decreased numbers from year-to-year *but* may result in reduced local populations during a given year. For example, the daily bag limit on cottontail rabbits in most Western states is 10. If someone were to hunt a 100 acre tract occupied by 50 rabbits at the start of the season and were to harvest 30 of the rabbits in one day (20 over the legal limit), the next person hunting the tract would find it difficult to harvest his *legal* limit of rabbits. Continued hunting of the area would result in fewer rabbits harvested.

A female cottontail is capable of producing up to 28 young a year and, in all probability, there would again be 50 rabbits present on the 100 acre tract at the start of the next hunting season. One of the primary functions of laws, regulations, and wildlife law enforcement is to insure an equitable distribution of the harvest to the sportsman.

The airing of "The Guns of Autumn" several months ago grossly misrepresented the

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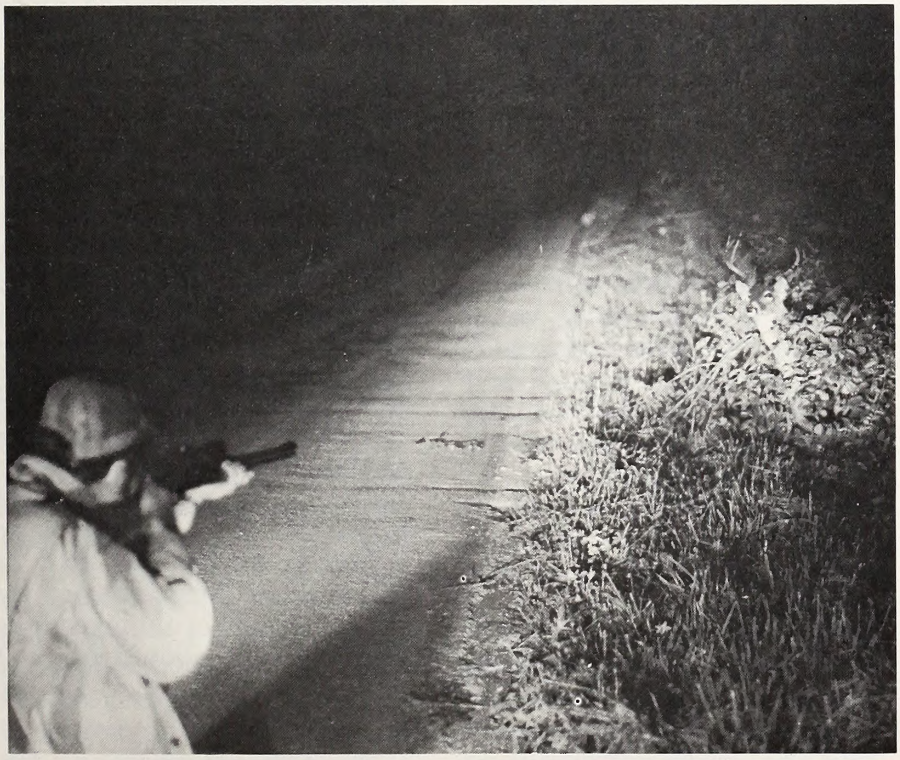

The game law violator, whether he begins shooting waterfowl early (opposite page) or firelights deer (left), is a thief; stop him.

Squirrels the Sly Way

by Frank Mooney

Each float trip for the gray squirrel seems like a first for me. A special feeling that's hard to describe seeps over me as the boat drifts silently downstream. I have hunted the ghost of the treetops many different ways, but to me, nothing surpasses this method for catching the gray completely flatfooted several leaps away from his den. Often the action is fast and furious when the squirrels are feeding near the dens and some unfamiliar sight or noise sends them scurrying for a hole.

One advantage for the float hunter is that squirrels normally expect danger from land; however, after a stream has been subjected to heavy hunting pressure in forms of floating objects which have hidden guns aboard, the gray squirrel quickly learns to keep one eye upstream.

Some squirrels are almost comical when confronted with a quiet, floating boat. They seem undecided about whether to regard it as something dangerous or a harmless floating object. Take for example a brave character that ran out on a limb almost overhead and tried to bluff down two armed hunters and a 14 foot boat.

During the 1974 squirrel season I figured Bret, my 12 year old son, was old enough to reap the harvest of a float trip.

By this time most of the leaves had fallen from the hardwoods and the dry carpet of leaves underfoot made hunting on foot unfeasible; this is when the float hunter comes into his realm. I was sure that Bret would take to this hunting like a hog takes to a mud bath, especially if the first trip was a success. Most hunters are within a short driving distance of a small stream or river that can be floated with comparable success; and like most hunters, we had a small stream within a twenty minute drive that supported a shootable number of corn and wild mast fed squirrels.

At times, cornfields along streambeds are subject to heavy depredation by the gray squirrel, especially when the corn is in the milk stage or if there is a shortage of mast in the hardwods. A cornfed bushytail is hard to beat in a steaming pot of dumplings or when added to a Brunswick stew.

Often when a small stream can be floated it can open up a new area to the squirrel hunter, like the small stream Bret and I hunted for the first time last season. Most of the hardwood trees had been cut near the stream but a thin line of den trees and nut producing hardwoods flanked both sides of the stream as it meandered slowly through farmland country. For the average squirrel hunter on foot it would have been a waste of time because of the excessive walking and lack of trees; but it was made-to-order for the float hunter.

A cold, ice-scraping, No-

vember morning was underway as Bret and I loaded the 14 foot aluminum boat into the old pick-up truck. The temperature was hovering around the freezing mark. "Dad, will the squirrels be out in this cold," Bret mumbled, shivering from the cold while waiting for the heater to warm up.

"I would think so, the gray squirrel is a hardy little fellow," I answered, "the weather has to be short of a blizzard to keep the bushytail in once day is breaking and there are nuts to be gathered."

In my other floating trips, I camouflaged the boat before starting the hunt but this time I decided against it and wanted to watch the reaction of the squirrels as they spied the bright color of the aluminum boat. I figured that if the squirrels had not been hunted by boat that it would not make all that much difference; if so, we could camouflage the boat along the way. An easy way to camouflage a boat is to place an old strip of rubber (like an inner tube) around the boat then place broomstraw or other natural foliage found along the streambed.

I was anxious to note if the squirrels would be greatly alarmed by the sight of a natural boat. With the high banks, most squirrels on the ground would not be able to see the boat anyway and normally this time of year the squirrel spends much of its time foraging among the new fallen leaves in search of nuts and other goodies.

Unloading the boat and sliding it down the deep bank, help to warm us up. This stream was only 30 to 40 feet wide with a slow current that gave us plenty of time to scan the banks and treetops. When squirrels first emerge from their dens or leaf nests around sunup they seem a little reluctant to leave the safety of the tree. As the morning progresses they venture farther away from the den. Floating the river at first light gives the avid hunter the added edge. The first couple of hours after sunrise will often be the most successful; however, I have seen times when the weather or some other factor retarded their leaving the den for an hour or so after first light. This is usually the exception and not the rule unless the weather is extremely cold.

Our timing was right as we silently approached the first bend in the stream; a gray was leaving its den and paused on the limb to survey its domain. A load of high-brass sixes from Bret's 20-gauge sent the squirrel cartwheeling to the grassy bank. Most trees along the stream were no good for lumber but exactly what the doctor ordered for the tree-loving grays. Most squirrels were in groups of three. The boat lodged on a submerged tree and it took some doing to free it. A nosy squirrel on the left bank noticed our activity and scampered out on a limb over the stream. As we drew nearer it began to bark furiously. It sprang into the hole near the end of the limb as we neared maximum gun range then back out again and continued to bark at us with its back legs still in the den. A heavy charge of sixes sent him plunging into the icy water.

Whenever possible, a car can be parked at the next bridge or take out point downstream thus saving the hunter a paddle back upstream. Unless the hunter is looking for exercise, having a predetermined take-out point downstream cuts down on the time and work especially if you float downstream a mile or two and are confronted with a paddle back against a strong current. When one doesn't have a deadline to make, it is often rewarding to stow your fishing tackle aboard and after you have taken your limit or the squirrel activity has ceased, to try the fish. Practically virgin water can be found a mile or so from a bridge and uneducated fish at times will almost fall over each other getting to your lure.

On several occasions I have heard squirrel hunters complaining about no squirrels when I could easily get my limit by floating down some stream near home. It's surprising that so few hunters take advantage of this way to hunt the nutcracker. It doesn't take a lot of equipment and no excessive planning is involved prior to taking the trip. Around my bailiwick I am grateful that much of the stream hunting is left for me to enjoy.

On warm, cloudy days gray squirrels can often be found foraging for food along the stream most of the day. Even around noon when one would think the grays were taking a cat nap it isn't uncommon to find one sunning on a limb or enjoying a light snack.

Several years ago, a friend and I floated a small stream that featured many black walnut trees, and the hungry grays had congregated around these trees foraging on the sweet meat of these nuts. They were some of the fattest and sassiest shade tails I had ever run into. For a few minutes at one grove the action was so fast that it was hard to pick a target. Squirrels scampered up and down most every tree in sight. I would bet a pot of squirrel dumplings that many of those grays had never seen a hunter. It made a firm believer out of me that float hunting for squirrels is hard to beat.

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SPLIT-SECOND

That is all it takes for a hunting accident to happen

by Gary Stevenson

Not long ago I was out dove hunting near Vander, North Carolina with my brother David. We had the field to ourselves and were taking a break when a bright red Pontiac pulled out into the middle of the field and disgorged a screaming mass of kids, shotguns, and discarded hamburger wrappers. David, already an experienced hunter at 13, shook his head and started toward the far end of the field. I only needed a few more birds to limit out so I stayed under my tree and watched.

During the next hour I saw those people break just about every rule of safety, courtesy, and common sense ever contrived. They shot at low birds, sparrow hawks, blackbirds, or anything else that came in range—which they seemed to think was anywhere within 100 yards of them. They yelled and screamed constantly. But the crowning touch was one young boy of about 12 who came running by me with his single-shot, break-action 12 gauge loaded and cocked. He looked at me like I was crazy when I told him that what he was doing was dangerous. David later told me he had seen the same boy sitting on a stump, his hands and chin propped on the muzzle of his gun. It was still cocked.

Later, as we picked up empty shell boxes, paper cups, and other trash they had scattered around, I thought about the mistakes I had made when I was their age. Although I didn't run through overgrown cornfields with my shotgun loaded or rest my head on its muzzle, I did make just about every other mistake they did. It wasn't stupidity, I just never had anyone to teach me any better. And, like them, I was sure that accidents always happened to other people, not me. I never, never dreamed how wrong I was to be.

Then I was 15 and a sophomore in high school. I met a guy who I'll call Tom; he was a year older than I was and he liked to hunt. Best of all, he had a driver's license and a car.

On December 10, 1968 we went dove hunting in western Sampson County, about 30 miles northeast of our homes in Fayetteville. About 3 o'clock or so we were walking single file through a woodlot. Tom was close behind me.

I remember hearing his 16 gauge double go off and the surprise at finding myself on the ground. My first thought was that I'd tripped over an electric hog fence—they were very common in the area and would explain the tingling

numbness above my right ankle. I instinctively reached toward the spot and my surprise turned to suffocating, sickening horror as my hand was instantly drenched crimson by the twin streams of blood gushing from two holes in eigher side of my leg.

Fright quickly became panic. Tom, seeing what he had done, threw down his gun and began running in circles around me, screaming hysterically. I clutched at the gaping wounds and also began yelling in frenzied terror.

Some seconds passed before I realized that I would be dead very soon if I didn't stop the bleeding. The entire load of number 8 shot had caught me squarely just above the top of my boot, smashing both bones in the lower leg and leaving entry and exit wounds about an inch and a half in diameter. Remembering what little first aid I'd had, I applied pressure to the wounds with the palms of my hands, but blood still spurted between my fingers and ran down my sleeves. Then, and I still wonder how I thought of it, I pulled off my belt and looped it around my leg just above the knee. I pulled hard, and miraculously the flow of blood slowed to a bare trickle.

This is not a pleasant story, and one that should not have happened. Don't let it happen to you.

After the initial shock my mind remained quite clear. There was no pain, just a dull throbbing. Belatedly, I realized both bones were broken when I tried to move. Tom was still racing around in total panic.

With a little effort I calmed him down enough to talk. The nearest hospital was in Fayetteville, about 45 minutes away. But the first 250 yards would be the hardest—there was a newly plowed field between us and the car. I outweighed Tom by 40 pounds, so there was no way he could carry me that far. He tried to help me get up and walk, but the shattered leg hung uselessly, totally unresponsive. The only way out was to bring the car to me. He ran off across the field. The next few minutes will always remain etched deeply in my mind. I was alone; the afternoon sun glowed golden through the trees. I felt a curious peacefulness, and thought how it would be so easy just to loosen the belt and die. Then I thought of my parents and six-year-old brother, and decided to fight it out. It seemed like such a simple proposition. Suddenly I felt hot and extremely thirsty. I fought an impulse to drink from a muddy spring bubbling nearby as Tom slid to a halt beside me in his little Karman-Ghia Volkswagen. He had stopped at the farmhouse for help, but there was no one home.

With Tom's help I struggled into the tiny back seat and tried to arrange my foot so that it wouldn't be bounced around too much and I could still keep the belt tight around my knee. A second miracle occurred when the Volkswagen pulled 250 yards, uphill, through a plowed, sandy field without even threatening to bog down and stick. Once we made it to the blacktop Tom headed for Fayetteville as fast as the little car and narrow road would allow. I fought waves of panic and dizziness, and prayed.

When we reached the hospital I figured that I'd be under a doctor's care immediately, but it didn't work out that way. I was a military dependent (my father was stationed at nearby Fort Bragg) and it was the incomprehensible practice of this particular hospital not to treat servicemen or their dependents. We were dumbfounded when the nurse in the emergency room told us we would have to go to Womack Army Hospital at Ft. Bragg for help. We didn't know where this hospital was located, so somebody called an ambulance while Tom called my father. The nurse did condescend to move me inside and put a rubber tourniquet on my leg in place of the belt.

When the ambulance arrived, two husky guys lifed me up and onto another stretcher, and for the first time pain screamed up through my leg. No splint had been put on the limb, and they had overlooked this small matter—when they moved me the unsupported foot fell off the edge of the table, dangling there under the cuff of my bloodsoaked pants.

A surgeon and various other white-clad officialdom were waiting in the Womack Hospital emergency room when we arrived. I knew I was reasonably safe now, and things were rapidly getting hazy. I saw my parents and tried to say something, but it never came out. I passed out, nearly two hours after the gun went off.

For the next week I lived in a drug-induced, foggy oblivion. The pain was now almost unbearable in spite of the drugs. Visitors quietly came and went, but I have no recollection as to who they were. My leg was in traction, with sort of a half-cast on it which allowed the doctors to examine it and change the dressings. The bare foot was a deep blue color, as if it had been severely bruised. There was no feeling in it, and I couldn't move my toes.

The idea that I might lose my leg had never crossed my mind on the day I was shot. Once I was admitted to Wom-

ack I was too doped up to worry about anything except that blessed injection every four hours. There was a vague awareness of the various attempts being made to increase the circulation to the foot and their subsequent failure. Sometime during the morning of December 15 the doctor came in to examine my leg. I remember him shaking his head bitterly and walking out as my parents broke down in tears. At 8 AM the next morning my leg was amputated about eight inches below the knee.

The following week went by rapidly. Strangely enough, after the operation I felt much better, and after a couple of days I was off the strong pain killer and sitting up in bed. On December 21 I was released from the hospital, looking forward to Christmas at home with my family and all the people who had visited me since the day it happened. For some reason, though, my strength was fading again.

By December 23 I knew something was very wrong. I couldn't breathe and was so weak I couldn't even turn over in bed without help. I was readmitted to Womack, where a new set of doctors diagnosed pulmonary embolism—a blood clot, probably from the amputation site, had been carried by the bloodsteam into my left lung where it caused a massive infection. On Christmas Eve a team of doctors performed a minor operation which drained the lung—it had filled with fluid and collapsed.

Two weeks of intensive therapy put me back on the upswing again. Pain and exhaustion gave way to boredom. By the end of January I was harassing the staff continuously in search of something to pass the time.

During all this Tom had been enduring a hell of his own. He missed several days of school after the accident, and after Christmas vacation things were worse than ever as word continued to spread. Tauts about being trigger-happy, great hunter, etc. often kept him on the verge of tears. He bleached my hunting coat in an effort to get the blood out of it, and spent hours trying in vain to soften and removed the caked blood from my boots and make them usable again. He visited me often, always bringing a gift of some kind.

In mid-February I was admitted to Duke Hospital in Durham to be fitted with an artificial limb. The staff at that huge place was amazing. They had the prosthesis finished by the end of the second day; on the morning of the third day they had me in the physical therapy gymnasium teaching me to walk on it. The therapist said it would be four to six weeks before I could walk unaided. Well, two months in a wheelchair and on crutches can do wonders for a lazy boy's determination. On the morning of the fifth day I walked across the gym.

School had not deserted me during my adventures. A tutor brought assignments in my courses so I could pass my grade that year; I even did well enough to be exempted from some of my final exams. I finished high school without serious problems—I did manage to break two prostheses before Duke's brace and limb shop built me one strong enough to hold up well. I entered college in the fall of 1971 and finished in May 1976 with a degree in Wildlife Biology. Tom finished high school and joined the Navy. He married soon after, and I haven't heard from him since.

This story runs through my mind each time I see someone being careless with a gun. In a sense, I was lucky in my accident—I'm still alive to tell about it, and my life hasn't been significantly changed. I can still do just about everything I did before. Hunting and target shooting are still my favorite pastimes. My brother, 15, is my favorite hunting partner and knows very well what a split second of carelessness can lead to. In an investigation after the accident, the trigger sear in Tom's gun was found to be badly worn. In all probability the weapon discharged without Tom's touching the trigger, regardless of whether or not the safety was on.

In almost all hunting weapons the safety only blocks the trigger, not the firing pin. Any sudden bump or vibration may shake the firing pin or hammer loose and cause the gun to go off. Please remember that, and take the time to teach any beginners the common sense rules of firearms safety. If you are just starting out, take advantage of the Hunter Safety courses available through the Wildlife Resources Commission.

Yes, maybe I was lucky, but all I have to do is take one step to be reminded that one infinitesimal instant of carelessness with a gun is all it takes to cause a life-long tragedy.

During the 1976-1977 hunting season, North Carolina recorded a total of 30 hunting accidents. Of these, 24 were non-fatal, six were fatal. What about this year?

Homemade Trout Fishing

by Willis King

PHOTOS BY THE AUTHOR

Anglers and fishery managers alike face the recurring question, "How can trout fishing be provided economically and on a predictable, biologically sound basis?" This report describes one way this has been done, given favorable natural conditions, adherence to a few basic principles, and a certain amount of good fortune. Good trout production and good fishing don't just happen. Trout can be considered a crop, to be produced in a semi-natural environment, with highly satisfactory results. A small man-made pond, properly built and managed can provide predictable fishing and excellent recreation on a sustained basis. This report describes the trout fishing produced in a 1/5 acre man-made pond in the Blue Ridge of Western North Carolina.

Description of the Pond

The pond is located 25 miles south of Asheville, in Henderson County in the Upper French Broad River basin. The small stream that supplies the pond is tributary to Crab Creek, flows down a north facing slope covered with hardwood forest. The stream arises as an underground drainage source, some 500 feet higher and about 1/2 mile above the pond site. It has no tributaries and no pollution. The normal flow is between .1 and .2 cubic feet per second (c.f.s.). The volume fluctuates slightly, mostly after heavy rains of as much as four inches in a period of a few hours. In this event, which has occurred a few times, the volume increases several times, but the water remains clear to lightly stained.

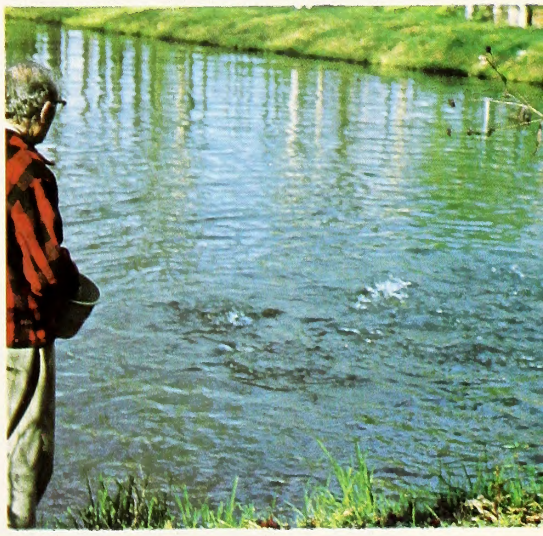
The watershed contains 40 acres of which the writer owns 33 acres including the source of the stream.

The site for the dam was selected with the assistance of the local Soil Conservation Service technician, who prepared a layout of the pond and drainage structures. This was done in the autumn of 1973. The pond basin was cleared that autumn and winter, requiring removal of 40 large trees, each with a d.b.h. (diameter, breast high) of 12 inches or more from a 1/2 acre area. Yellow poplar was the dominant tree, with a mixture of other hardwoods including white oak, northern red oak, cherry birch, beech, several kinds of hickories, blackgum, dogwood, hophornbeam, and sourwood. The trees were utilized as saw timber or for firewood.

Basic construction was completed in May 1974, using a bulldozer and power shovel. Fine grading of the dam and banks, seeding and mulching followed immediately.

The pond is triangular in shape, about 125 feet on each side. The earthen dam has a clay core extending down to impervious materials. It has a flood spillway 1 1/2 ft. deep by 18 ft. wide. This has carried excessive runoff only once in three years. Normal discharge is through an 8 inch standpipe or trickle tube, connected by a T to a similar diameter spiral steel pipe which extends 60 ft. through the dam. A sliding valve is fitted to the pond end of this pipe, and the standpipe has a removable trash rack. The maximum depth of the impounded water is 7 1/2 ft., the average depth 4 1/2 ft. The pond surface is about 8,000 sq. ft., and the total water volume .6 acre foot.

This is a portion of the pond discussed in the article. Feeding (below) was done daily, early in the morning.



In designing the pond, careful consideration was given to water depth and its effect on temperature. At the source the stream temperature is 54 °F. and rises not more than 10°F. during its course to the pond, even in the warmest weather. Incoming water flows to the bottom, circulates and rises to the overflow level. The temperature rise in the pond has not exceeded 10°F. The pond does not stratify; no thermocline has developed.

There has been no evidence of oxygen deficiency. Deeper ponds not many miles distant do stratify and have had oxygen and temperature problems. I consider surface overflow in small ponds managed for trout to be a desirable feature.

Also, there has been no aquatic weed growth, and filamentous algae became abundant only once, in February 1976, after an unusual warm spell of weather. There were no fish in the pond at the time.

Management Concepts

There are differing concepts and procedures for managing trout in ponds held by biologists and resource managers. Some are important, and doing the right thing at the right time is likely to mean the difference between success and failure, between profit and loss.

These primary considerations can be grouped under the following heads:

a. Stocking: What species, in what numbers, what size, and when?
b. Feeding: Should the fish be fed, what kind of feed, how much and how often?
c. Fishing: Can it be allowed, and need it be controlled?
d. Drainage and recovery of trout: Should this be an annual procedure?

I will explain these as carried out for the pond described here.

Stocking: Being somewhat partial to brook trout, I wanted to try that species first. So 400 brook trout averaging three to the pound were stocked in the new pond June 24, 1974, a month following its completion. The fish came from a commercial hatchery in the area and were considered disease free stock. They soon became adjusted and thrived. However, the "brook only" stock produced 50 rainbows. Table 2 provides detailed data on the recovery for the first year of operation. Because of the late start, the trout did not have as long a period in the pond as did those in succeeding years.

For the second year (1975), brook trout were not available in the area, so I obtained 500 rainbows 8 to 9 inches in length and averaging four fish to the pound. These were stocked April 25. Table 3 gives the details on the 1975 production record. The fish were in

TABLE 1. SUMMARY, PRODUCTION AND LOSS, ALL YEARS.

Item	1974 Brook	1974 Rainbows	1974 Both	1975 all Rainbows	1975 Brook	1976 Rainbows	1976 Both
Number of trout stocked	350	50[1]	400	500	120	360	480
No. recovered	275	49	324	453	89	326	415
Percent recovered	78	[2]	81	90	74	90	86
Wt. of fish stocked (pounds)	116	17	133	125	30	120	150
Wt. recovered (pounds)	195.5	48	243.5	337.5	67.5	332	339.50
Wt. increase (percent)	68	182[1]	83	170	125	175	166
Mortality observed (number)	14	1	15	10	2	4	6
Unaccounted loss (number)	61	[2]	61	37	29	30	59
Unaccounted loss (percent)	17		15	7.4	24	8.3	12.3
Total losses in percent	21		19	9.4	26	9.4	13.5
Date stocked			June 24	Apr. 25			Apr. 16
Pond drained			Nov. 20	Oct. 30			Oct. 19
Days in pond			148	187			185

[1] estimated
[2] not known

TABLE 2. TROUT RECOVERY RECORD, 1974.

By angling	Brook number	Brook weight	Rainbow number	Rainbow weight	Both species number	Both species weight[1]
June	2	1.00	2	1.00	4	2.00
July	24	12.50	3	1.75	27	14.25
August	30	24.50	5	5.00	35	29.50
September	21	17.00	1	1.00	22	18.00
October	140	100.00	18	19.25	158	119.25
November	50	36.00	3	4.25	53	40.25
All angling	267	191.00	32	32.25	299	223.25
At draining	8	4.50	17	15.73	25	20.25
Total recovered	275	195.50	49	48.00	324	243.50
Total stocked	350	113	50[2]	20	400	133

[1] all weights in pounds
[2] estimated

TABLE 3. TROUT RECOVERY RECORD, 1975

By angling	Rainbow number	weight[1]
May	43	18.00
June	26	11.75
July	6	5.00
August	97	44.75
September	15	11.50
October	75	75.00
All angling	262	166.00
At draining:		
larger fish	(146)	(154.25)
smaller fish	(45)	(17.00)
All at draining	191	171.25
Total recovered	453	337.25
Total stocked	500	125

1/ all weights in pounds

the pond 35 days longer than in 1974. I believe the pond was somewhat overstocked with 500 fish since some fish remained small, and the weight gained was not as great as in the following year with fewer fish. However, there may have been other influencing factors.

For 1976, I ordered 240 rainbows and 240 brook trout to see what the combination of equal numbers would produce. Again, I was thwarted when 360 rainbows and 120 brook trout were delivered and stocked on April 16. The rainbows averaged three to the pound and the brook trout four to the pound. Table 4 provides catch and recovery data for 1976, when the population was mixed. The ratio was basically the reverse of that in 1974, the first year.

The fish remained healthy all three years, and no mortality from disease was recognized. There are no wild fish in the stream, so there was no contamination from that source.

The use of subadult fish (three or four to the pound) rather than fingerlings, and spring release as opposed to fall stocking, are at variance with the recommendations contained in USDA Farmers' Bulletin No. 2249. The latter recommends fall stocking of fingerling trout.

Feeding: One of my objectives was to produce fast growing, good quality fish. Natural food alone would have supported a smaller population than was stocked, estimated at not more than 100 trout of 8 to 9 inches in length. A Supplemental feeding plan was carried out during each of the three years. The fish were fed Purina Trout Chow (the only commercial feed available locally), floating type, usually in the early morning, six days a week. The fish began feeding within a few days after stocking and learned to expect the morning feed regularly. The amount fed was what the fish would take readily, but not more than about three pounds of feed per day. Table 5 summarizes the amount of feed used each year and the weight gained by the trout.

After the first two weeks, feeding was done only from one side of the pond. It is likely that not all fish learned to feed equally well, since two size groups could be recognized as the summer advanced. This situation was apparent in 1975 when only rainbows were stocked and in 1976 for both species. The smaller fish were active, developed good color, but remained at near their original length and weight. They were most frequently seen along the pond margin. Although failure to feed properly was probably the basic cause of their lack of growth,

Continued on page 26

TABLE 4. TROUT RECOVERY RECORD, 1976

By angling	Brook number	Brook weight	Rainbows number	Rainbows weight	Both Species number	Both Species weight[1]
May	1	.75	7	4.25	8	5.00
June	11	6.75	36	25.25	47	32.00
July	18	12.75	25	16.75	43	29.50
August	1	.50	31	30.75	32	31.25
September	11	7.75	42	37.25	53	45.00
October	23	18.50	68	76.50	91	95.00
All angling	65	47.00	209	190.75	274	237.75
At draining: larger fish	(15)	(17.00)	(81)	(130.50)	(96)	(147.50)
smaller fish	(9)	(3.50)	(36)	(10.75)	(45)	(14.25)
All at draining	24	20.50	117	141.25	141	161.75
Total recovered	89	67.50	326	332.00	415	399.50
Total stocked	120	30	360	120	480	150

1/ all weights in pounds

TABLE 5. FEEDING AND PRODUCTION RECORD

Item	1974	1975	1976
Total weight fish recovered[1]	243.5	337.5	399.5
Increase in weight	110.5	212.5	249.5
Trout Chow fed, pounds	250	300	350
Pounds of feed to produce 1 lb. fish	2.2 : 1	1.4 : 1	1:4 : 1
Cost data			
Cost of trout	$200.00	$225.00	$240.00
Cost of feed	51.50	63.00	77.00
Miscellaneous costs	13.50	17.00	20.00
Totals	$265.00	$305.00	$337.00
Cost per pound of fish recovered	$ 1.08	$ 0.90	$ 0.84
Cost per fish recovered	$ .82	$ .67	$ .81

1/ all weights in pounds

Surf Trout

by Joel Arrington

PHOTO BY CLAY NOLAN
N.C. TRAVEL & TOURISM DIVISION

There are no famous speckled trout fishermen in the sense of famous tarpon fishermen or marlin or bonefish anglers. Trout, also known as spotted seatrout, will not strip your reel of line, leap from the water, nor fight with the tenacity of a tuna.

But they offer a considerable angling challenge in the surf, mostly because they are difficult to locate, and once located, they are often finicky about taking lures. For that reason, and because they are a favorite food fish in the South, "specks" are prized beach catches from the Virginia Capes to the Gulf of Mexico.

The species ranges as far north as New York, but most are caught south of Chesapeake bay. They spawn from March to November in sounds, where the young develop. Some adults move into the ocean and along the beaches, but a portion of the population remains in the sounds.

In most years, surf trout average about two pounds, so the occasional five-to six-pounder is considered a trophy. The state record, from Wrightsville Beach, weighed 12¼ pounds, while the world all-tackle record, from Florida, went over 15 pounds.

Recognizing good surf locations for "specks" is a skill that comes only with experience. Being there at the right time introduces another difficulty. Skilled anglers have a higher success rate than novices, but luck still plays a large part.

Mobility is of prime importance in any surf fishing. This means some kind of beach vehicle is essential for consistent success. Trout fishermen typically drive the beach, looking for good locations and swapping information.

A good slough for trout (and several other surf species, for that matter) is produced by a bar within 150 feet of shore. Good sloughs are open at both ends and are at least six feet deep. Trout tend to exit sloughs that are too shallow on low tide, but that same slough may harbor many fish on high water. Another good location is inside a long bar that has a cut, sometimes called an "outsuck," through the middle. Fish will traffic through the cut feeding on bait in the slough.

There are exceptions, but

generally, trout fishing is best at dawn and dusk. Cool, cloudy days can produce at any time. Night tides frequently are productive. Most experienced surfmen expect the last two hours of the ebb, low tide, and the beginning of flood to produce best.

Lure action is of paramount importance in trout fishing. Often, anglers standing side by side, fishing the same lure, will have dramatically different results. There are trout magicians. These skilled anglers who produce when all others fail are likely to be credited with luck. It may not be so.

One rule, if there are any in trout fishing, is the colder the water, the slower the lure action. Plugs may produce best when allowed to first sink to the bottom. A slow retrieve, raising the rod tip rhythmically, is often productive. Jigs — both bucktails and the soft-bodied varieties — should always be allowed to sink and should be brought back in slow hops. Good advice is to watch productive fishermen. When you feel a strike, set the hook firmly, but not too vigorously, because seatrout have fragile mouths ("weakfish") and you may tear out the hooks.

Ideal trout tackle is a whippy spinning rod from six to eight feet in length. Such rod action is easier on the fishes' fragile mouths and it works lures well. Small freshwater, open-face spinning reels, especially those with slow retrieve ratios, are favored by most trout specialists. Six-to ten-pound test monofilament is standard. Lures should be tied directly to the line, since no leader is necessary. In fact, a leader may reduce the number of strikes in clear water.

The most popular lures include reflective minnow imitations, such as the Mirro-Lure. Favored models are half-ounce silver-sided plugs with red heads, yellow plugs with red heads, silver ones with red backs and plugs with blue, black or green backs. When long casts are called for, 5/8-ounce and 7/8-ounce plugs are used.

Always, lead-head jigs have been good for trout. Butterbean type bucktails in the 3/8- to 5/8-ounce range with chrome, white, yellow or pink heads still are widely used. But in recent years, bucktails have been largely replaced by soft-bodied jigs. Usually heads are red or white and have painted eyes. Plastic or rubber tails may be flourescent orange, white, green or raspberry, to name a few favorites.

No one with any surf fishing experience at all would attempt to gaff or net a trout. Fish should be beached. There is a little trick to this, but it is easily mastered. After gently playing out the trout, lift it in front of a wave, permitting the water to carry it to shore. If the fish breaks seaward, lower the rod tip and let it go. Work it back toward the beach. Eventually, a wave will deposit it at your feet — high if not dry.

Most trout fishermen kick their fish to a point above high water. It is best to remove the lure with pliers while holding the fish gently to the sand with your foot. This way you do not get slime on your hands and you can quickly get back into action.

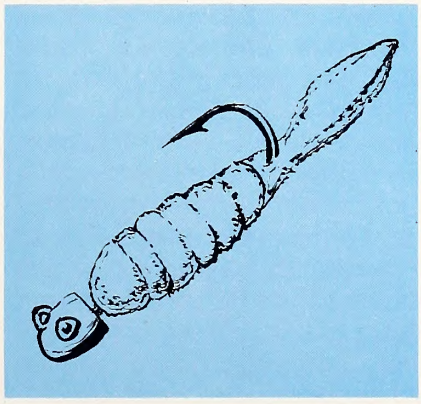
Although a few trout are caught from the surf year around, the best season, far and away, is fall. Specialists do not even consider going until the first cool weather of October. Consequently, waders are essential. Warm underwear and sweaters should be topped with rain gear, both to break a chilly wind and to shed spray.

When the surf has been churned by high seas and is dirty ("thick" is the coastal word) trout either leave the beach or get lockjaw. At least moderately clear water is essential for success.

Spotted seatrout spoil more quickly than more light-fleshed species, such as flounder. They should be iced as soon as possible and cleaned the day they are caught. Fish over two pounds should be scaled and filleted. Although moderately oily, trout may be frozen for up to six months if they are dropped into paper milk cartons, covered with water and frozen in the resulting block of ice.

Seatrout are good fried, broiled with lemon and butter and especially baked with sliced almonds. Place several filets, skin side down, in a buttered casserole. Salt and pepper, dot the fish with butter and bake at 350 degrees until the fish just begins to flake easily with a fork. Sprinkle a handful of sliced almonds over them and place the pan under a broiler until the fish are done to taste and the almonds are golden brown. Remove to a warmed platter, garnish with parsely and lemon slices and serve a green vegetable and rice or potatoes.

There may be no famous trout fishermen, but this recipe can make you a famous trout cook.



ENVIRONMENTAL BRIEFS

By Frank Barick

Chemical Forest Management

The N.C. Forest Service recently completed the second year of a pilot program designed to reduce the amount of soil disturbance and erosion sometimes associated with tree planting while at the same time resulting in substantial cost reduction. About 75 areas averaging about 40 acres in size in all parts of the state were sprayed with 2, 4-D and 2, 4, 5-T. In some cases the purpose was to release young pine from hardwood competition; in others it was to kill back the vegetation to expedite burning prior to planting.

Wildlife Commission Biologists here and in other states, as well as water quality technicians, have been monitoring such operations to detect whether the chemicals used were resulting in injury to fish and wildlife, with concern centered about the dioxin component of the chemical. Dioxin is a short-lived but highly potent poison that appears to cause chromosomal aberration. Recent advances in manufacture have reduced its occurrence to below the EPA mandated .05 parts per million and to date there do not appear to be any adverse results from its application.

The American Fishing Tackle Manufacturers Association is funding a comprehensive research program at Tulane University in New Orleans to derive at solutions to toxicity problems. The study will focus on translocation mechanisms and seasonal fluctuations in fish collected from contaminated waters. Laboratory investigations will attempt to develop decontamination methods.

PCB's to be Controlled — Maybe

Of 1.4 billion pounds of PCB's produced since 1929 about 500 million pounds have entered the environment. EPA studies indicate that they are present in varying concentrations in every species of wildlife on earth. PCB's are complex hydrocarbons that contain from 12 to 68% chlorine. They are used to insulate electrical transformers and capacitors, and are also in such varied products as brake and hydraulic fluids, caulking compounds, carbonless carbon paper, paint, plastics, epoxy resins, silo sealer, paper food packaging, printers ink, xerox toner and many others. PCB's can cause both benign and malignant tumors in mice, rats and mink and reproduction disorders in birds and other animals. In 1968, over a thousand Japanese became ill after eating rice oil contaminated with PCB's. Among the effects were nerve and liver damage, reproductive disorders, skin lesions, swollen eyelids and numbness of extremities. Another problem is that PCB's deteriorate slowly and remain in the environment for 60 to 80 years.

On December 22, 1975 the EPA announced a policy of totally eliminating PCB's as rapidly as possible. Whether this can actually be done remains to be seen. Monsanto, the sole U.S. producer, has made some limitation in produciton and sale but large amounts continue to be imported from foreign sources.

Oak Trees Hard to Grow

The various species of oak are strongly favored by wildlife biologists because they produce large amounts of highly nutritious food favored by many forms of wildlife. Foresters are having a difficult time in growing oak trees, however, because acorns are so highly prized by not only many game animals but also mice and insects. What the weevils don't get the rodents do. In one study, they actually pulled up or chewed through the plastic tubes that were intended to protect the acorns. Those that did manage to get by were subsequently severely browsed by deer. Forestry researchers of the U.S. Forest Service are focusing on the problems of oak regeneration since it is also a highly valuable timber species.

Federal Funding for Nongame Wildlife

The Hart bill, currently under study by the Congress, would provide federal funding for conservation and management of nongame fish and wildlife by state wildlife agencies. If passed, it would provide $20 million in FY 1978 and larger amounts in subsequent years on a 75% - 25% cost-sharing basis. North Carolina does not at present time have any funds from nongame sources.

Some authorities have suggested a state tax to provide such funds on items that are normally purchased by bird watchers and nature lovers such as binoculars and scopes, photo equipment, bird books and bird seed. According to a recent news release from the National Audubon Society, the nation's bird watchers are currently spending about half a billion dollars annually on such items. A one percent tax would yield about $100,000 per state that could be used for matching federal appropriations to improve habitat and conduct other work on behalf of song birds and other nongame species of wildlife.

Hunting, Fishing Memorabilia Sought

What do you know about the history of wildlife conservation in North Carolina? When did people first become interested in the future of wildlife? When did they begin to regulate hunting and fishing and trapping? What were those early regulations like? What sort of research and habitat improvement programs did North Carolina have years ago?

The North Carolina Wildlife Resources Commission is interested in learning as much as possible about early wildlife conservation in the State.

"We think that tracing the history of wildlife conservation would be both interesting and educational to a lot of people from school kids to adults," said Sid Baynes, Chief of the Division of Information and Education. "We don't even know a lot about the early years ourselves because the Wildlife Commission was formed in 1947.

"We also hope to gather some early memorabilia for a display which we plan to set up at the State Fair in October, 1978," said Baynes. "We're looking for old fishing licenses, old copies of regulations, badges, photographs and that sort of thing. We'd be interested in anything old that pertains to hunting and fishing, especially in North Carolina.

"Another thing we'd like to locate is an old diary of hunting, fishing, camping or other outdoor adventure written sometime around or before the turn of the century," said Baynes. "We think it would be interesting to get this kind of glimpse at what hunting and fishing was like in the state back then. If we find what we're looking for, we may even publish it in WILDLIFE IN NORTH CAROLINA magazine."

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Big Game Tagging Procedures Explained

Deer hunters will find some changes in the mandatory big game tagging procedure this season.

The main change for the 1977-78 deer season will involve the use of the tag and the big game kill report.

This year, the tag must not be removed from the carcass of the animal until it is finally skinned and dressed for consumption. Last year, the tag was removed and attached to the Big Game Kill Report. The Big Game Kill Report must be obtained and completed prior to the final skinning for consumption.

Hunters will also note other differences in the tagging procedure when they purchase their big game licenses this year. This is the first year that the "Hunter's Choice" tags will be in effect for either-sex deer hunting in certain parts of the State. Sportsmen are urged to pay particular attention to the instructions which accompany their tags and big game license.

Those who have questions should contact their local wildlife enforcement officer or contact the N. C. Wildlife Resources Commission, 512 N. Salisbury Street, Archdale Building, Raleigh, North Carolina 27611. The toll-free telephone number is 1-800-662-7137.

Wildlife at the Fair

The Wildlife Resources Commission will have its big fish tanks on display at this year's State Fair, October 14 through October 22. The native fish exhibit was a very popular one a couple of years ago, and now will be back. Come and see it.

Fun to Learn

BY ED JENKINS

BOAT COVERS FOR ADDED PROTECTION

A good cover is "must" protection for any boat and motor. This is particularly true on boats that see a lot of trailering action.

While many boaters scoff at covers, the outdoor authorities at Mercury outboards suggest that leaving the fine interiors of today's boats exposed to flying debris and other hazards of the highway is simply unwise.

It's true that boat interiors are made to withstand moisture. But if that moisture comes in the form of rain while a boat is being trailered at 50 mph or so, the interior ends up taking a real bombardment.

Additionally, a boat cover provides security of a sort for whatever gear you may store in your boat. While it certainly isn't "thief-proof," a cover acts as a deterrent to thieves by keeping your possessions out of sight. It's somewhat comparable to putting packages inside your car's trunk (out of sight) or just putting them in the back seat (where they can be seen—and pilfered).

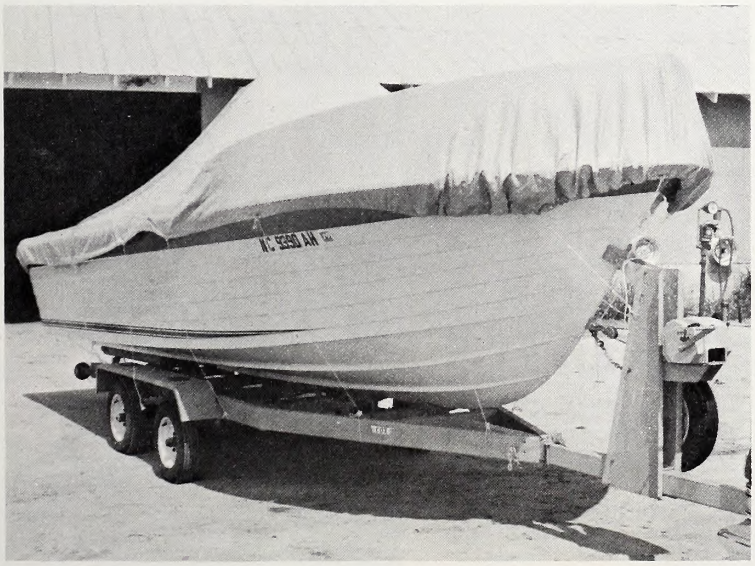
When you choose a cover for your boat, you don't have to give up good looks and you don't have to fret about the difficulty you'll have putting it on and taking it off.

Modern boat covers come in a variety of colors, styles and materials. The most popular ones are the lightweight, closely woven cotton canvas covers. Although cotton has a natural water resistance, boat covers of this type are treated with a water repellent chemical for further protection.

Another advantage to the cotton type is its ability to "breathe." That means water won't condense on the underside. (A cover that holds moisture can do more damage than leaving a boat uncovered.)

Your marine dealer can order standard cut covers for most boat models, or you can outfit your boat with a custom made cover. When properly fitted, the cover should go on easily—and obviously come off just as easily.

A good boat, and the equipment it carries, deserves the protection afforded by a cover. And, if you happen to dock in a open slip, the cover will keep the interior dry on those damp mornings.



An open shelter offers protection from the weather, but not from messy birds. This boat cover keeps the interior clean during storage. Although you can't depend on it as "thief-proof," it does keep items out of sight.

PHOTO BY ED JENKINS

by Marcia Constantino

WILLIAM B. UMSTEAD STATE PARK

A thousand years ago, the 5,000-acre area now known as William B. Umstead State Park was a wilderness dominated by American bison, elk, bobcat, beaver, and hundreds of other animals of the hardwood forest. One hundred years ago, the land was occupied by settlers. Magnificent oaks, hickories, and beeches were felled to make way for fields of grain and other farm crops. Today, the park, situated in the populous Research Triangle Park region, is once again heavily forested with little indication of the farming activity that occurred here until the early 1930's.

Over 460,000 visitors a year are attracted to the recreational and interpretive facilities for camping, picnicking, boating, fishing, hiking, horseback riding, and nature study.

During the Great Depression of the 1930's, the land was purchased by the federal government from farm owners who could no longer afford to work the land. The Civilian Conservation Corps (CCC), a government program formed to provide employment for the thousands of jobless, began the transformation of what was to become one of the most visited Parks in North Carolina.

The young men of the CCC planted trees, put in trails, checked erosion, built roads and campsites, and constructed and stocked lakes. The abandoned farmland, its topsoil drained off by generations of lumbering and unscientific farming practices, began to mend itself. It was allowed to revert to nature, and a mixed pine and permanent hardwood forest resulted.

World War II closed the efforts of the CCC, and in 1943 the land was deeded to the State of North Carolina for public recreation and scientific study. The park was known as Crabtree State Park until 1955 when it was officially dedicated in memory of Governor William B. Umstead, who had made outstanding contributions to the field of parks and conservation in North Carolina.

Nearly 1,235 acres of the park had been set aside for black citizens in 1950 and called Reedy Creek State

Big Lake on the Crabtree section of the Park, offers fishing and boating. Only electric trolling motors are permitted. A wide variety of wild flowers like this cardinal flower, brightens the Park during much of the year.

Park. In 1966 the park was integrated under the name of William B. Umstead State Park. The 3,954-acre Crabtree Creek section off U.S. 70 northwest of Raleigh and the Reedy Creek section, accessible only from I-40, are administered separately, each with its own superintendent.

Nature Interpretation Program

Old field succession, the natural process by which abandoned fields became forest lands, accounts for the great diversity of plant and animal life in Umstead Park. Over 1,100 species of plants and a few hundred species of mammals, birds, and reptiles have been identified here.

The imaginative interpretation program is designed to encourage the visitor to observe natural processes, ask questions about them, and to appreciate man's kinship with nature. The program is carried out by park rangers and naturalists through the use of slide programs, nature displays, special events, research projects, and nature trails.

During the summer months special evening programs are held in the camping area. Naturalists lead nighttime nature hikes or present slide lectures about the park's wildlife. Bulletin board displays interpret the park environment, emphasizing certain natural features which might spark the visitor to investigate further.

Umstead is a center for continuing natural research. A number of university research projects have involved the study of the wood duck, grey squirrel, tulip poplar, and the pine tree. The Carolina beaver, which had disappeared from the area, was reintroduced and now a thriving population flourishes in and around Crabtree and Sycamore Creeks.

A fifty-acre natural area consisting of a virgin remnant stand of beech trees and some Southern sugar maple has been designated a National Natural Landmark by the United States Department of the Interior.

The hiking trail system criss-crosses the park's varied terrain: flat land in the flood plain and on ridge tops, steep slopes along the creeks, and gently rolling lands.

Sal's Branch Trail traces old field succession in detail for two miles among running cedar and Christmas fern. Along the trail are furrows and rows where cotton and corn were planted more than forty years ago. Sycamore Trail wanders for 2.9 miles along creeks and over ridges. Spring wildflowers including Jack-in-the-pulpit, pink lady slipper, rattlesnake orchid, and iris can be seen along the damp creek banks. Sycamore Creek is inhabited by small fish, salamanders, and freshwater clams.

Granite outcroppings more than 250 million years old and a mill lie along the Company Mill Trail, the park's longest trail at 3.5 miles. Beds of mountain laurel, galax, and purple rhododendron, typical mountain flora, grow in profusion on the trail's cool, north-facing slopes. Loblolly, Virginia and short-leaf pine are prominent on the 1.1-mile Dogwood Trail, which connects the Sycamore Company Mill Trails.

The .4 mile beech trail joins

PHOTOS BY JIM PAGE

Family tent and trailer camping is available in the Crabtree section. Check in with park officials for regulations and locations. Horseback riding is popular on the bridle trails in portions of Umstead Park.

the Crabtree and Reedy Creek sections of the park. It travels through mixed pine and hardwood forests, beech stands, and river birch. The lucky visitor may spot wild turkey, deer, and small mammals including rabbit, raccoon, foxes, and squirrel.

The park office, open from 8:00 a.m. until 12:00 noon weekdays, supplies materials to inform and assist the park visitor. A trails and facilities map, nature trail booklet, and checklists for mammals, birds, and reptiles are available on request. Visitors should seek assistance from park rangers when the office is closed.

Public Recreation

Visitors to the *Crabtree Creek section* can enjoy picnicking, fishing, boating, hiking, horseback riding, and family tent and trailer camping.

Two separate picnic areas off the main park road are settled among towering pines. Over 100 tables, outdoor fireplaces, two shelters, restrooms, and drinking fountains can accommodate hundreds of day users. The Crabtree Self-Guiding Trail makes a .8-mile loop off the first picnic area. Numbered posts along the trail are keyed to a descriptive booklet available at the park office. Nature walks are led by a park naturalist on Sundays at 3:00 p.m. and some weekdays from April through October.

A short trail off the parking lot at the second picnic area leads to Big Lake, a 55-acre man-made lake. At the boathouse visitors may rent rowboats daily from 12:00 noon until 8:30 p.m. June 1 through Labor Day, on weekends during the spring and fall months. The fee is $.75 an hour. Small electric trolling motors may be used on park boats. *No other water craft are permitted on the lake.* Oars, life preservers, children's safety vests, and anchors are provided by the park. Before noon, anglers may obtain at the park office a key to the boating area and its equipment. Fishing from lake shore or boat is good for largemouth bass, crappie, and bream. No swimming is permitted.

Twelve miles of hiking trails and 16 miles of bridle trails wind throughout the Crabtree Creek section. The bridle trails connecting both sections of the park are marked by white-capped posts. Located to give the rider a scenic ride, the trails vary from the open road to the single lane trail.

The family campground has 28 tent/trailer sites. Each site is equipped with a picnic table, fireplace, and parking space. There are no hookups for trailers, but drinking water is available. A washhouse with hot showers, flush toilets, and laundry tubs is convenient to all campers.

The smaller *Reedy Creek section* has public recreational facilities for picnicking, fishing, hiking, and horseback riding. The single picnic area has 68 tables, grills, a covered shelter, restrooms, water fountains, and a large parking lot for 500 cars.

The Reedy Creek Self-Guiding Trail with descriptive markers enables visitors to learn about the park's diverse and colorful plant and animal life. Starting point for the interpretive loop trail is between the parking lot and the picnic area. During the summer months, the seasonal park naturalist conducts Sunday nature walks at 1:30 p.m. and 3:00 p.m.

Anglers can fish from the shore at designated areas along Reedy Creek Lake. Bream, crappie, catfish, and largemouth bass are the most abundant panfish. There are no facilities for boating.

Six miles of bridle trails are part of the larger system which extends throughout both sections of the park. The three miles of hiking trails also tie in with the network of marked nature trails.

Organized Group Camping

Four organized group camps, three in the Crabtree Creek Section and Camp Whispering Pines in the Reedy Creek section near the lake are for use by Scout groups, church groups, and by other recognized non-profit youth and adult organizations. Camps Lapihio, Sycamore, and Crabtree are clustered near Sycamore Lake. Each camp has cabins, a well-equipped dining hall, a craft building and swimming pier for use by group campers. The entire camp or its separate units may be rented by the week in summer and by the day during other seasons.

The group camps offer an excellent opportunity for outdoor educational programs. Many North Carolina school classes come for one week sessions in environmental education. Instructional guides and materials are prepared by various state agencies working together.

Maple Hill Lodge is available to youth groups for semi-wilderness camping. Primitive facilities include a fireplace, water supply, and pit toilets.

Reservation forms and information about facilities and fees can be obtained from either park superintendent.

For more information write Crabtree Creek Section, William B. Umstead State Park, Route 8, Box 13, Raleigh, N.C. 27612; and Reedy Creek Section, William B. Umstead State Park, 1800 Harrison Avenue, Cary, N.C. 27611.

- Letters
- Comments
- This & That

BACK OF THE BOOK

Dear Sir:

We, at the Florida Wildlife Sanctuary, thoroughly enjoy your publications and wish more people would read this type of magazine rather than the slanderous gossip newspapers like the *Midnight*, *National Enquirer*, etc.

The Florida Wildlife Sanctuary, which is the first wildlife hospital in the nation open 24 hours a day, is also an environmental clearing house to answer questions on any living creature for various organizations. As part of our environmental library, we subscribe to practically all Game and Fish Commission and conservation magazines. In fact, we receive these publications from most of the 48 state Game and Fish Commissions, in addition to *Mainstream* from the Animal Protection Institute, *Zoo Reviews*, and *Wilderness Reports*.

We would like to compliment you on your magazine and its beautiful stories to better educate the public, especially the young people, as well as some of the beautiful pictures that are shown on wildlife in its natural habitat.

If more people would read publications such as yours, they would learn more about their neighbor next door.

Carlton O. Teate, Executive Director,
Florida Wildlife Sanctuary
Rt. 1, Box 260 EG
Melbourne, Florida 32935

Conservation Retreat

A meaningful and enjoyable learning experience about North Carolina's scenic, historic, vulnerable, harsh and living seashore. This family oriented environmental educational program is sponsored jointly by the North Carolina Museum of Natural History and the Extension Forestry Resources Department of the North Carolina Agricultural Extension Service. Coastal lands management, forestry, wildlife, shorebird ecology, estuary, major photography, outerbanks folklore, surf fishing are only some of the thought provoking and educational classes which will be offered on October 6-8, 1977.

For additional information call or write: **Program Information:** Fall Conservation Retreat, Extension Forestry Resources Department, PO Box 5488, North Carolina State University, Raleigh, NC 27607, Ph: 919-737-3386. **En-**

KNOW YOUR ENFORCEMENT OFFICER

Peter G. Deal

Wildlife Enforcement Officer Peter G. Deal is the son of Mr. and Mrs. Coley V. Deal of Aurora. Officer Deal graduated from Aurora High School and attended the University of North Carolina at Chapel Hill. He was employed by the Wildlife Resources Commission September 16, 1974, and is stationed at Plymouth with his work area including Washington, Hyde and Tyrrell counties.

Since his employment with the Wildlife Commission, Deal has attended the Wildlife Recruit School and the Wildlife Basic School at the Institute of Government at Chapel Hill.

Peter is married to the former Sophia Gerrard of Aurora and they have one son, Timothy Glenn. Deal is a member of the N.C. Law Enforcement Officer's Association and the Law Enforcement Section of the Southeastern Association of Game and Fish Commissioners.

DIVISION OF WILDLIFE ENFORCEMENT RECORD FOR JULY

HUNTING AND FISHING

Persons Checked	25,921
Total Prosecutions	1,418
Total Convictions	1,284
Total Fines Collected	$4,339.00
Total Costs Collected	32,886.00

BOATING

Persons Checked	19,802
Total Prosecutions	956
Total Convictions	849
Total Fines Collected	$1,513.00
Total Costs Collected	$20,235.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

rollment Information: Fall Conservation Retreat, Annie Moxley, Division of Education, North Carolina Museum of Natural History, PO Box 27647, Raleigh, NC 27611, Ph: 919-733-7450.

N.C. Wildlife Federation Meets

The 32nd Annual Convention of the N.C. Wildlife Federation will begin at 9:00 A.M., September 29, and run through Saturday, October 1, 1977. The three day convention will be held at the Royal Villa Convention Center, Highway 70 West of Raleigh. The lineup of events scheduled for this year which include a special three day Outdoor Recreational Vehicle Show which will be open to the public.

The Host of this years Convention will be the Wake County Wildlife and Sportsman's Club. Club members along with the Convention Chairman, Jim Stephenson, are planning a full, interesting and stimulating program of events.

Rufus L. Edmisten, North Carolina Attorney General, will present the Governor's Awards to the winners at the banquet and Awards Dinner Friday night.

The luncheon at noon Friday, September 30, will include a distinguished guest in the person of the Honorable Robert L. Herbst, Assistant Secretary of the Interior who will deliver the McClamroch Lecture.

Hunters and fishermen, everybody, will be particularly attracted to the big Safari Show on Thursday, September 29, at 8:00 P.M. Wally Taber, internationally known hunter, fisherman and film maker brings his big new film show to Raleigh. Bucks 'N Gobblers and Less Time Between Bites will not only entertain but will teach the interested many 'how-to' tricks of the experts. The public is invited to attend and tickets are available from Wildlife Club members or at the door. Those registering for the Convention will have an opportunity to get tickets when they register.

As a final and outstanding event, Safari Club International joining with the N.C. Wildlife Federation will hold the third annual Big Buck Contest with displays, trophies, certificates, prizes and Boone and Crockett scoring. These awards will be for bucks taken during 1976 and will include typical and non-typical classes. Displays will be open all day, 9:00 'til 9:00.

Wally Taber, right and Al Brothers, admire a 10-point buck rattled in during the filming of Taber's Safari Show scheduled for September 29 at 8 p.m. The double-feature is open to the public.

Trout from page 15

there may have been genetic differences in the fish stocked. The conversion ratio of 1.4 lbs. of feed to 1 lb. fish flesh (1975 and '76), indicates that natural foods were a substantial part of the diet. Trout, when dressed, were examined for stomach contents, and insects and crustaceans were commonly observed. At no instance during the three years, was there evidence of cannibalism. Fish could be observed feeding most often mornings and evenings, a common occurrence in trout.

NEXT MONTH:
The conclusion of Homemade Fishing

Wildlife Violations from page 7

hunting experience of the average hunter and the positive contributions of wildlife management. For all its faults, biases, and un-truths it may have done some good. We realize that among our number there are those who do not respond to the sportsman's code of ethics. We should stop relying totally on a relatively small number of dedicated wildlife law enforcement officers to control the actions of millions of sportsmen. Even with modern methods, they cannot do the job alone; they need your help.

The next time you observe early shooting in the marsh or hear about someone taking more than his fair share of game, do something about it. Use your personal judgment

when entering into a potentially dangerous situation. It is contrary to our nature to "inform" on someone. If you do not feel right about reporting a violation committed by a friend or acquaintance, simply tell him what you think about his illicit behavior. Tell him that you have been waiting two years to see the excitement in your child's eyes when he bags his first rabbit, quail, or waterfowl. The extra rabbit or quail he so nonchalantly bagged could have been your child's *first* trophy.

The only way to put a stop to wanton violation of wildlife laws is citizen action. You can help by criticizing those who violate game laws and by accurately reporting violation information to your local wildlife enforcement officer. The key word is "INVOLVE—MENT". Contact your local wildlife officer and ask him how you can help. Form groups, contact local judges, and emphasize to them the need for stiffer fines.

Many non-sportsmen do not report violations because they are unfamiliar with hunting season dates and the laws pertaining to hunting. Contact these persons and give them a copy of the state hunting regulations digest so that they too can be on the lookout for violations. Citizen groups in several Western states are attempting to put the damper on violations by contacting judges, being more vigilant to wildlife law violations and criticizing those who violate game laws.

The incident I described at the beginning of this article was not faked or trumped-up; it actually happened. Last December I again persuaded my wife to go duck hunting with me. We arose at 4:30 a.m. on a bleak morning in December. We hunted on a different marsh in a different state. The situation was different this time; the early shooting began 20 minutes before legal shooting time instead of 15 minutes.

I personally contacted several of the groups whom I thought had started the early shooting. Members of the groups flatly denied violating the law. Hopefully my strong criticism of their illicit actions will prompt them to think next time before damaging the hunting experience of sportsmen. I took down the car tag numbers of the groups involved and relayed them to the local wildlife enforcement officer. He'll keep a watchful eye for the groups next time they're in his area and hopefully will capture them red-handed.

I fear my wife will no longer accompany me on future early morning duck hunts. She has had enough. Her first two duck hunting "experiences" were ruined by the actions of others. I no longer try to "explain away" the actions of a small minority of my fellow sportsmen.

Squirrels from page 9

The current squirrel season runs from October 17-January 31*. With this long season the Tarheel hunter can enjoy an 8 per day bag limit. This long season goes to prove that this versatile animal can bounce back from heavy hunting pressure and still yield a bountiful supply the following year. This is like having your cake and eating it too.

If your squirrel hunting has slacked off lately, or you hanker for a new method to hunt this great gamester, try squirrels the sly way—but be careful—it's habit forming.

**Holly Shetter Game Land, Pender Co., October 1 - January 1*

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FOX TROT

Seldom is the photographer in the right place at the right time to catch shots like this. H. George Zellers of Raleigh met this gray fox taking a late summer stroll; this time George had his camera.

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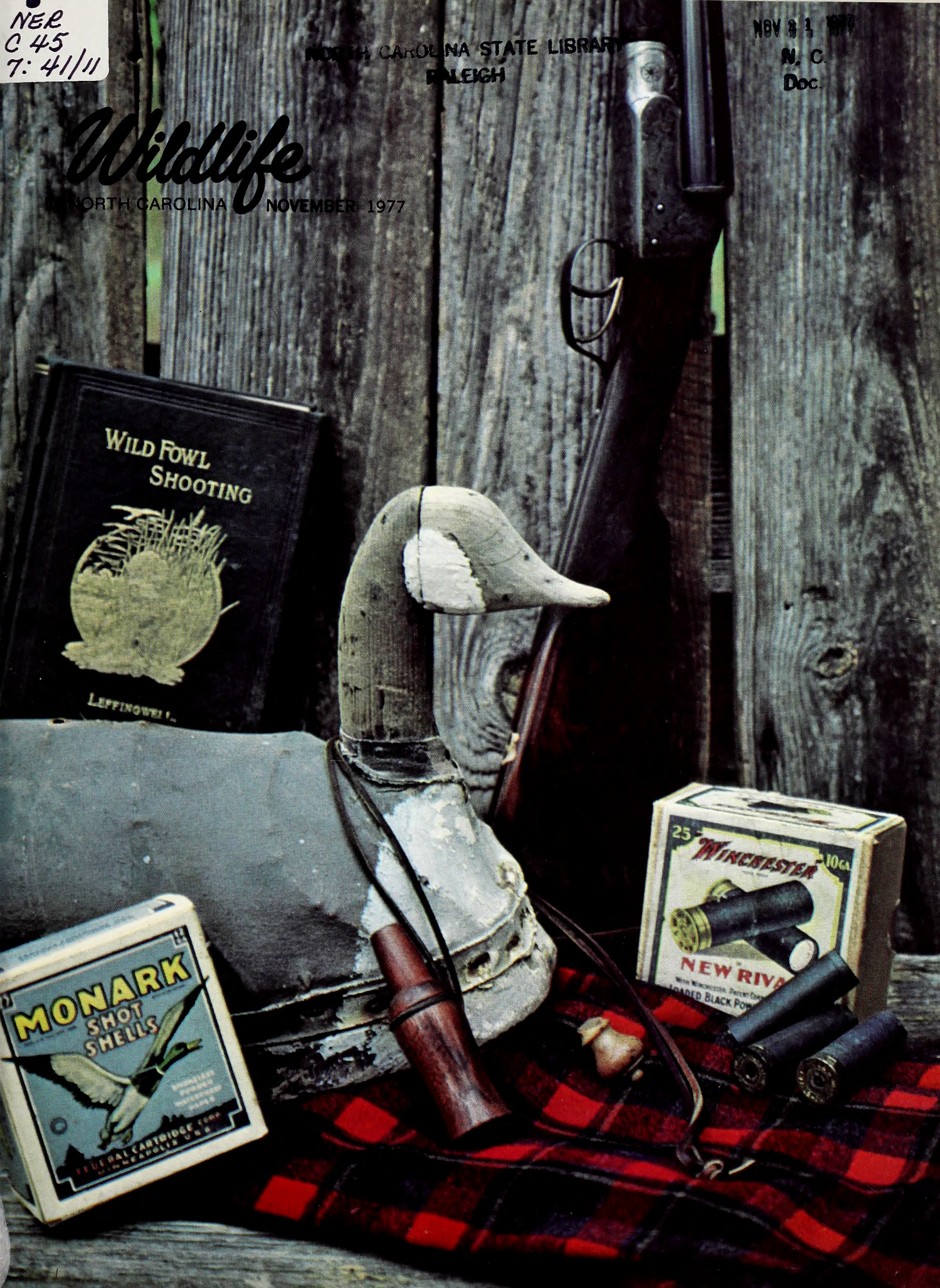

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An Equal Opportunity Employer

The world of waterfowl decoys is a fascinating one of interest to the hunter, the collector and just about anyone with a taste for the outdoors. This month's cover featuring a canvas-covered Canada goose decoy of the Currituck Sound region, was taken by Jim Dean and serves as a lead off to a series of articles on decoys by Jim Lewis. This begins on page 12.

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Wildlife IN NORTH CAROLINA

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VOL. 41 NO. 11 NOVEMBER, 1977

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BOBWHITE

Inquiries about wildlife and other prints, and original art work should be directed to Barbara Winstead, 262 Surry Trail, Rome, Georgia, 30161.

1975

Aphrodite's Ghost

The Swan in North Carolina

As the October full moon begins to wane in coastal Carolina, thousands of ghostly white forms glide majestically into their age-old watering spots to spend the winter. The whistling swan migration is at full peak. Flights containing up to five hundred birds each will settle onto the Pamlico Sound, the Pamlico River, Currituck, and Mattamuskeet. By the end of the fall migration, nearly fifty thousand of these beautiful birds will have made the trip from the vast wilderness reaches of the Arctic Circle and the Bering Sea. The whistling swan winters on coastal United States from as far north as Maryland, sometimes even as far as New Jersey, to the Gulf coast, and along the Pacific coast as far south as San Diego. According to Bent, a few may winter irregularly in the interior as far north as large bodies of water may be found.

The whistling swan is one of three varieties of North American swans. The other two found on the continent include the mute swan, which is a European variety imported into this country and most commonly seen in European parks. They are easily identified by the presence of a bright orange bill and a knob at the base of the bill which is not seen on either the whistling swan or the trumpeter swan.

Much has been written in recent years about the trumpeter swan and its slow comeback from the brink of oblivion through the work of dedicated biologists, supported by the sportsmen and environmentalists. John Lawson, writing in 1709 (Lawson's "History of North Carolina"), believed that the trumpeter swan could be found in coastal Carolina

PAINTING BY G. MICHAEL SMITH

by R. Wharton Gaul, M.D.

along with the Hooper's or whistling swans. To quote him: "Of the Swans, we have two sorts; the one we call Trompeters, because of a sort of trompeting Noise they make.

"These are the largest sort we have, which come in great Flocks in the Winter, and stay, commonly, in the fresh Rivers till February, that the Spring comes on, when they go to the Lakes to breed. A Cygnet, that is, a last Years' Swan, is accounted a delicate Dish, as indeed it is. They are known by their Head and Feathers, which are not so white as Old ones.

"The sort of Swans called Hoopers, are the least. They abide more in the Salt-Water, and are equally valuable for Food, with the former. It is observable that neither of these have a black Piece of horny Flesh down the Head and Bill, as they have in England." However, the presence of the trumpeter swan in North Carolina has not been subsequently confirmed.

Swans are worldwide in distribution. In Europe, in addition to the semi-domesticated mute swan, are found Bewicks and the Hooper swan. The South American continent boasts two varieties of swans, and "down under," the Australians have their own species of black swan. But for the State of North Carolina, when you say "swan," you mean the whistler.

Swans have had an important place in the history of the human race. Many references to this bird are found in ancient history. For example, it is said that the goddess Aphrodite (Venus) considered the swan to be one of her favorite creatures. Two in particular have come down to us as indicative of the high regard in which the ancients held them. In "Plato's Dialogues," Socrates describes the swan as singing its death song in happy anticipation of the life in the world to come. Socrates states that he himself will accept his cup of hemlock and go out no less merrily. On a somewhat different plane, it should be noted that when Cleopatra came forth to meet Anthony, she sailed in a boat shaped like a swan. In fact, many ancient boats were designed to resemble the swan. In the opera "Lohengrin," the hero is brought into the world upon a swan's back in the first act. Almost anywhere you look in ancient history, you will eventually run into some reference to this bird. Even the Blackfoot Indians have incorporated the swan into their traditional mythology.

The whistling swan, proper name *Cygnus columbianus*, is one of nature's most magnificent creatures. The adult is snowy white with a black bill. Some whistling swans have a yellow spot in front of the eye but it is not always present. However, this spot when observed is limited to the whistling swan. They weigh up to twenty pounds, and measure up to fifty-five inches in length. In flight, they migrate in small V-shaped flocks, and sometimes in long waving lines. They can travel at speeds up to sixty or eighty miles an hour, and with a tail wind may exceed one hundred miles an hour.

Their call has variously been phonetically reproduced as "wow-wow," or "hoo-hoo," giving rise to many of the colloquial names. The whistling swan nests in the far north. For the most part, they breed beyond the encroachment of civilization. Their breeding grounds will range from Baffin and Victoria Islands, across the shores of the Beaufort Sea, and south along the shores of the Bering Sea. Most of them winter along the coasts of Virginia and North Carolina, and along the California coast of the Pacific.

Swans mate for life, and the female, or pen, lays anywhere from two to seven eggs, although four or five is average. Predators of the nest and young birds include Eskimos and Indians, and the various other mammals and birds that prey on the young of migratory fowl. The eggs hatch after some thirty-five to forty days, most of them being hatched by July 1. They are in flight by the middle of September, and by the middle of October the migratory patterns are resumed.

In North Carolina the earliest records of exploration showed a vast number of whistling swans on the waters of the coast. We have already quoted John Lawson. The early waterfowlers of Currituck, and later of Mattamuskeet and the Pamlico, occasionally hunted this bird, but such hunting was usually incidental to the quest for ducks and geese. The meat of the young swan, the cygnet, is quite palatable, but that of the adult is tough and not particularly flavorful. Swan plumage had a vogue in decorating women's hats during the 1800's, and the down of the swan (one thinks of a product that Miss Kate Smith has advertised in years gone by) had a market in the past, but the bird itself is so wary as to make the hunting of it extremely difficult. However, in Canada, in the early 1800's, anywhere from three to five hundred swan skins were handled annually by the Hudson's Bay Company. Between 1853 and 1877, the company sold 17,671 swan skins.

From this point on, the trade in swan skins diminished rapidly, primarily due to decrease in the numbers of the birds. According to the ornithologist Nuttall, the trumpeter swan furnished the bulk of these skins, and this is one of the major factors in the persistent low number of trumpeter swans in North America. However, to a certain extent, the whistling swan also suffered. Predation by Eskimos, gulls, otters, mink, and other wild animals on the breeding grounds has been a fact for thousands of years. Swan eggs and young swans suffer significant losses at the hands of Eskimos and Indians.

Waterfowlers, particularly on Currituck but later on the Pamlico Sound and at Lake Mattamuskeet, learned that the whistling swan was considered as a symbol of security by many other waterfowl. This was particularly true of widgeon and was also true to a certain extent of the wild goose. Canvasbacks also seem to feel more secure in the presence of swans. Waterfowlers learned early to add swan decoys to their decoy rigs, and a few of these curious old decoys can still be seen in private collections. Most of them were made from white cedar.

A flight of whistling swan rising gracefully is a sight not quickly forgotten. Speeds of over 75 miles per hour are common.

The widgeon, or bald pate, was particularly attracted to the swan because of their similar feeding habits. The swan is almost entirely vegetarian, feeding on wild celery and foxtail grass, and on a minimum of animal matter. We will have more to say regarding the feeding habits of this bird later in this story. Although a change in their feeding habits has recently been noted, with more and more migration into grain fields, particularly corn, wheat, rye and grass, this is not a new development. This type of feeding was reported as early as 1891 and probably observed even prior to that.

One of the oft repeated tales about the whistling swan has to do with the so-called death song of this bird. This was reported by Doctor D. G. Elliot in 1898 and has been reprinted by both Bent and Kortright in their wild fowl studies. According to Doctor Elliot, "I had killed many swan and never heard aught from them at any time, save the familiar notes that reach the ears of everyone in their vicinity. But once, when shooting in Currituck Sound over water belonging to a club of which I am a member, in company with a friend, Mr. F. W. Leggett, of New York, a number of swan passed over us at a considerable height. We fired at them, and one splendid bird was mortally hurt. On receiving his wound the wings became fixed and he commenced at once his song, which was continued until the water was reached, nearly half a mile away. I am perfectly familiar with every note a swan is accustomed to utter, but never before nor since have I heard any like those sung by this stricken bird. Most plaintive in character and musical in tone, it sounded at times like the soft running of the notes in an octave, and as the sound was borne to us, mellowed by the distance, we stood astonished and could only exclaim, 'We have heard the song of the dying swan'." The hunting of this bird was brought to a halt in 1916 and I am aware of no further reports of this phenomenon.

NEXT MONTH:
The Conclusion of Aphrodite's Ghost

The injured doe was towed to an island in Hub Quarter Creek to recuperate. Her wounds were such that she simply didn't make it. And the hounds were free to kill again.

Hounds on the Loose

Story and Photos by Charles L. Lehning, Jr.

• It was about 11:30 the morning of June 11, 1977, and I was trolling the east bank of Hubquarter Creek near the main run of Lake Gaston. The hum of the motor was broken by the sound of two hounds hot on the heels of a deer. A few seconds later, a one-third grown doe broke into the open with two big hounds right behind.

The doe hit the water but the big ones were right on her. I quickly beached my boat without a thought of motor and the big ones took off. The little one looked at her benefactor. Not sure of my interest in her, she took off along the bank. The doe had not gone over 40 feet when out of the woods bounded the hounds. The poor little doe let out another cry for help and again I went to the rescue.

When all was quiet, I went back to my boat to resume my fishing. A third cry for help came before I could get the motor started. The battery was down and I scrambled to pull the starter cord. Before I could beach the boat again, the hounds had her down. Again they took off into the woods. The little one took a good bit of time deciding what she should do and to get herself together from the last encounter. Not being ready to trust men, she took off around a big bend at the point and out of sight.

The next cry for help was more pitiful than the ones before and the growls of the hounds sounded as if they had moved in for the kill. The old man scrambled back again and got the motor started. This time when I beached the boat, the little one was in serious condition. The hounds backed off, one to the right and the other to the left waiting for me to move off and leave them to finish the doe that they had pursued so long.

I decided I was not going to leave the doe for a meal for the hounds even though she died. I chased the hounds away, but what was I going to do? I put a rope around her good leg and planned to take her to the other side of Hubquarter Creek. Having once been kicked on the back of the hand by a downed deer, I approached the job of fastening the rope with caution. With the rope fastened and the deer in the water, I started the slow pull to death or safety. The head stayed out of the water and ears were up. I decided the island in Hubquarter Creek was the safest place for the doe. Once a big wave rolled over her but she came up okay.

Beached on the island, she looked in poor condition. I had done all I could do so I left her. I reported my encounter to Officer Wayne Wicker, for whom I have very high regards, who checked on her.

Later in the evening, I carried my grandson Lance Lehning with me to check on the doe's condition. Her eyes were alert, her head resting on her back and her ears up. We both went to bed feeling better about our deer.

Lance was afraid the doe was getting hungry so he got a sack of fresh, tender leaves and we went to the island so he could feed her. When we got to the island, we found her dead. She had moved some 30 feet from where we had left her the night before.

What a pity, what a loss and to think the hounds were free to chase again. That afternoon, Wayne performed the last rites by removing the poor little one from the island.

PETTIGREW STATE PARK

by Marcia Constantino

A sense of history, nature study in a Coastal plain environment, and facilities for outdoor recreation merge in Pettigrew State Park to provide varied opportunities for visitor enjoyment. Located on 16,000-acre Lake Phelps in Washington and Tyrrell Counties, Pettigrew State Park includes the lake and 769 acres of land on its north and south shores.

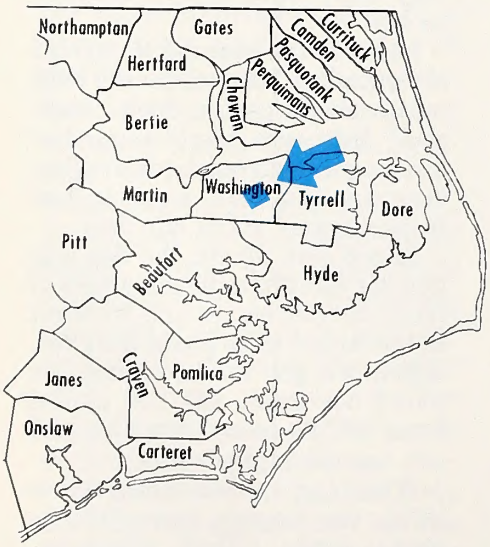
Fed by rain and freshwater springs, Lake Phelps is the second largest natural lake in North Carolina. It is known throughout the southeast for its excellent bass fishing.

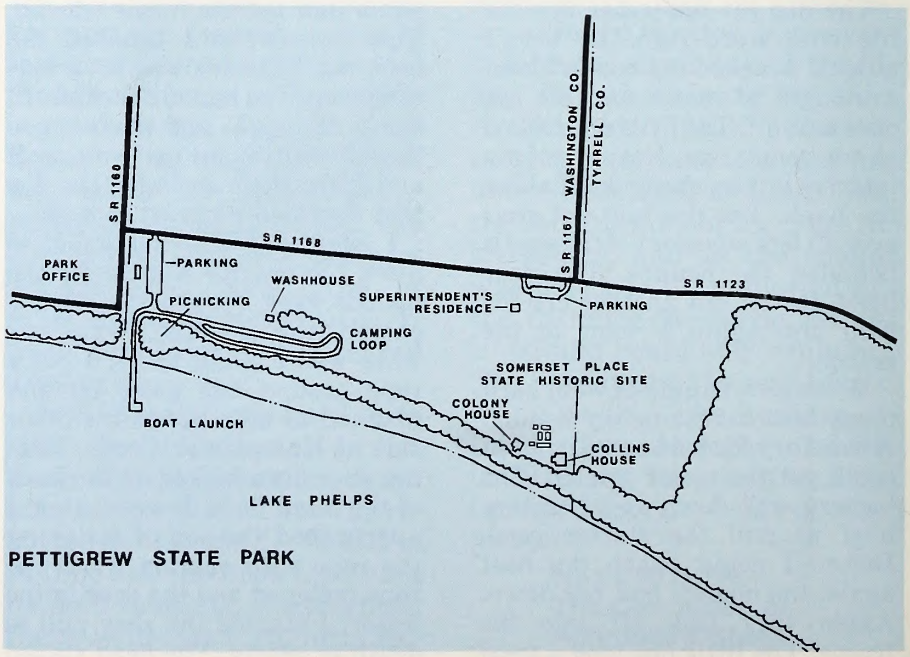
Until 1755 the Lake Phelps region, a dense swamp wilderness, was called "The Great Eastern Dismal" and "The Great Alligator Dismal". Few people had courage enough to enter this "haunt of beasts". According to tradition, the lake was discovered by a group of local hunters who had ventured into the region in search of farm and hunting lands. It is said that Josiah Phelps was the first among the band of hunters to run into the lake, thus claiming the right to name it.

Somerset Place

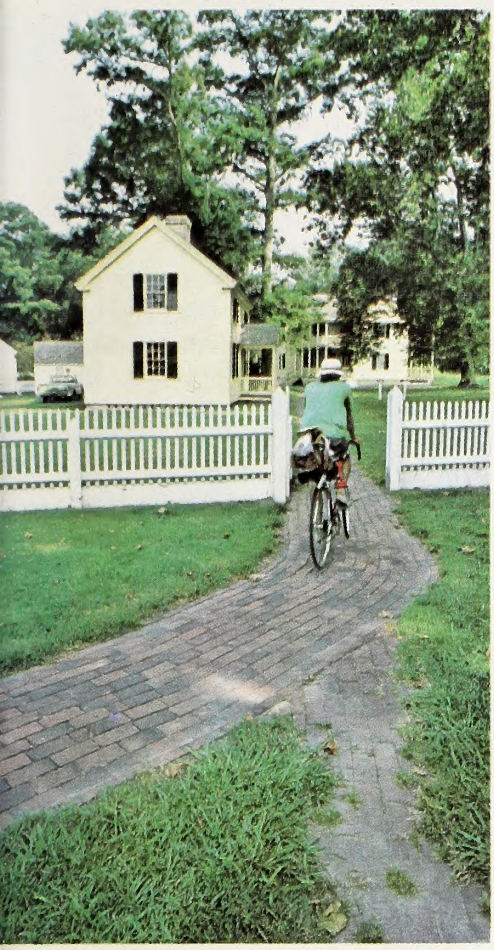
Pettigrew State Park encompasses parts of two original Lake Phelps plantations — Somerset Place, home of the Josiah Collins family, and Bonarva, home of the Pettigrews. Confederate General James Johnston Pettigrew, for whom the park was named, was born and buried here. The family cemetery is all that remains of the Pettigrews.

In the 1780's a group of North Carolina businessmen, led by Josiah Collins, Sr. of Edenton, formed the "Lake Company". After acquiring over 100,000 acres of swamp land around Lake Phelps, they set out to drain the land for farming. The canal dug by slave labor connected the lake





Pettigrew State Park is located in Washington and Tyrrell counties (above) and features many natural and recreational attractions.



Trailer and tent campsites are available (opposite page) and are open all year for family camping. Somerset Place (left), has largely been restored and is open to the public. Picnic tables are provided along the shaded shore of Lake Phelps amid cypress and sweet gum trees (below). Fishing (right) can be very good, with bass and panfish the main attractions. No hunting is permitted.

with the Scuppernong River.

Eventually Josiah Collins bought out his partners and began developing Somerset Place plantation, named for Somersetshire, Collins' home county in England. He willed the plantation to Josiah III, his oldest grandson.

Josiah III finished building Somerset Place, which consisted of the family mansion, twenty outbuildings, large gardens, lawns, tree-bordered drives, and walkways. In 1830, Josiah III and his wife moved into the fourteen-room mansion, where each year the Collins family hosted parties, balls, formal dinners, and music recitals from early fall to late spring.

Today Somerset Place is administered as a historic site by the State Department of Cultural Resources. Interior restoration and furnishing of the Collins mansion was completed in 1969. Restoration of the outbuildings is still going on.

Original buildings still standing include the Collins mansion, the kitchen-laundry, dairy, kitchen storehouse, icehouse, smokehouse, and the Colony House, which now serves as a visitor center. In addition, the bathhouse, overseer's house, and washhouse have been reconstructed for adaptive use.

The mansion reflects two types of architecture popular when the house was constructed — Greek Revival and traditional coastal. The Greek Revival style is evident in the triple windows and surrounding exterior moldings, doors and mantels inside, and interior door and window frames. The traditional coastal influence is seen in the double deck verandas employed to capture the breezes.

The mansion was constructed from heart cypress cut on the plantation. The furnishings, carefully selected from the 1810-1860 period, reflect Josiah Collins' taste. Only a few original pieces of furniture belonging to the Collins family remain.

The garden beside the house probably contained vegetables and herbs for use by the Collins family and their slaves. Growing there now are English boxwood, crepe myrtle, a variety of fruit trees, and a huge magnolia tree reputedly planted by Josiah Collins.

The carriage drive originally bordered the lake, running from the Scuppernong River past the Collins mansion to Bonarva. A three-mile stretch of the old carriage drive along the north shore of Lake Phelps, now a nature trail, is open for hiking between Pettigrew State Park and Somerset Place.

Somerset Place Historic Site is open daily from 9:00

a.m. to 5:00 p.m. and from 1:00 to 5:00 p.m. on Sundays. It is closed Thanksgiving Day and two days at Christmas.

Guided tours are furnished, and admission is free.

Recreation

Pettigrew State Park's recreational facilities are clustered around the north shore of the lake, which attracts fishermen, boaters, campers, and picnickers. (Supervised swimming is not currently available.)

Park rangers are on duty to inform visitors about park facilities and services and to interpret the park environment for them.

An angler's paradise, Lake Phelps has largemouth bass, white perch, channel catfish, and panfish.

Spring and fall are the best seasons for catching largemouth bass, many weighing two to four pounds each. Daily catches are limited to eight bass.

White perch, ranging from one to two pounds apiece, are most numerous during the summer months. There is no legal limit on the number caught.

Channel catfish, some weighing more than twenty pounds, bite best in early spring.

Boating is second only to fishing in popularity on Lake Phelps. Pleasure craft — canoes, kayaks, sailboats — mingle with bass boats on the calm, shining lake. Conditions for sailing on Lake Phelps are ideal. The water is free of obstacles, and a constant, gentle breeze blows across the lake.

Public facilities on the north shore include a boat ramp and five rowboats which can be rented for $.75 an hour or $2.00 a day. The park visitor can use his own motor on a rental boat.

Private boats are permitted on the lake, and waterskiing is allowed.

Thirteen sites open all year for family tent and trailer camping are settled among cypress and sweet gum trees and in open areas. The campground has a partial view of the Collins mansion at Somerset Place Historic Site.

Water, flush-type toilets, and hot showers are available to campers. There are no electric or water hookups for trailers. Reservations for campsites can be made for a minimum of seven days and a maximum of two weeks. The cost is $3.50 a day for each family or group of four individuals. Campers with pets pay an additional $.50 per day for each uncaged animal, which must be kept on a six-foot leash. Unreserved campsites are assigned on a first-come basis.

A special undeveloped area of the park is designated for tent camping by nonprofit youth group organizations. Group leaders should make advance arrangements with the park superintendent.

Near the camping area, wooded groves shade seventeen picnic tables and three grills. A large grassy field around the area affords open air fun for campers and daytime visitors.

Nature Study

Lake Phelps is an important wintering and nesting area for the Canada goose and several species of ducks. Between 2,000 and 5,000 of these birds arrive each fall to feed on the natural vegetation and small animals in the reeds and rushes along the lake and in adjacent fields. Most are Canada geese flying in their distinctive V-shaped formation.

The most numerous ducks are the black duck, ruddy duck, and merganser. Pintail, lesser scaup, and ring-necked duck also migrate to the lake. The area has become a permanent nesting area for the wood duck.

In the brushy habitats along the shore live several of Pettigrew State Park's year-long bird residents — osprey, great blue heron, kingfisher, and many wading, shore, and song birds. Black bear, infrequently seen along the shore, keep to the heavily wooded areas near the lake. White-tailed deer are abundant, using the woods for protective cover and feeding.

The forest serves as protection for several species of fur bearing animals such as raccoon, opossum, mink, muskrat, foxes, and bobcat. Only the muskrat and the raccoon are dependent upon the lake.

Some upland game species in the park are quail, mourning dove, woodcock, rabbit, and gray squirrel.

Plant life at the park is typical of the Coastal Plain. Wildflowers include buttercup, iron weed, mist flower, spotted touch-me-not, and jack-in-the-pulpit. Small numbers of Venus flytrap grow in the wet areas.

Growths of cypress, poplar, sweet gum, sycamore, pecan, and pine trees dot the lakeshore. Some of the giant bald cypress and equally impressive poplars bordering the north shore have trunks exceeding six feet in diameter. The well developed under story beneath the cypress is dominated by paw paw, Virginia willow, and spicebush.

For more information about the N.C. State Park System write N.C. Department of Natural Resources and Community Development, Division of Parks and Recreation, P.O. Box 27687, Raleigh, N.C. 27611.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Water Cleanup Needs Public Support

The U.S. House of Representatives is scheduled to study amendments to the Clean Water Act during the next several months. We are just starting to realize the benefits of this Act and the results of the cleanup efforts are becoming evident. It is vitally important that you contact your Congressman to let him know that you do not want any amendments that would weaken the requirements of the Clean Water Act or delay their dates of implementation.

Bladen Lakes Game Land Closed to Bear Hunting

The Bladen Lakes State Forest Game Land will be closed to bear hunting this winter by the N.C. State Forest Service. Sportsmen can consult the hunting regulations for areas which are open to bear hunting this season.

WILDLIFE for Christmas

Many folks on your Christmas list would enjoy 12 months of the outdoors through the pages of WILDLIFE IN NORTH CAROLINA. We hope that you'll consider using the convenient order form inserted in this issue. It's a big $2 worth!

November Big Hunting Month

The season on nearly every huntable game species is either open or will open sometime during November. Pick up your copy of the current Hunting and Trapping Regulations at your hunting and fishing license agents. The first portion of the split season on geese (Canadas and snows) is November 22 - November 26. It reopens December 7 and closes January 20. Daily bag limit is 1 Canada and 2 snow geese.

Wildlife Art Exhibit

A bigger and better Wildlife Art Exhibit is planned by the Wake County Wildlife Club for December 1,2, and 3 for Raleigh's North Hills Mall. See page 24 of this issue for complete details.

Hunter Safety - Your Responsibility

Every time you pick up your gun this hunting season, you have the important responsibility of using it safely. It's up to you.

PART 1

SOME NORTH CAROLINA

DECOYS AND THEIR MAKERS

BY JAMES S. LEWIS, JR.

The time may come when the old duck hunter is content to put his gun away, throw the patched-up waders in the garbage can, and reflect in comfort on occurrences which could be considered pleasant only in retrospect: Wind-driven, icy rain that flattened the brown marsh grass and sent a trickle of cold water down the back of one's neck; the whistle of overhead wings as one crouched in the darkness before daybreak; the cold day you stepped off into water over your waders but stayed shivering to limit out. But, then, there was that perfect shot when you connected dead center, with a twenty-foot lead on a passing teal speeding downwind at 60 miles per hour. May our accommodating memories exclude the many easy shots we've missed.

However, it may turn out that memories are not an adequate substitute for the excitement and punishment which are a part of waterfowl hunting, so where does the hunter turn? In

many cases, to the collecting of decoys. This is an interest, though, which is not limited to hunters, for collectors are spread widely across the continent. It is not rare to see a fine collection of waterfowl or shorebird decoys which has been put together by a woman who has never fired a gun, and may never have seen a wild duck on the wing. The art which in some degree was whittled into the shaping of every old hand-carved decoy assures its permanent attractiveness.

The value that collectors attach to old handmade decoys was revealed when the very large collection of the late W. J. Mackey was sold at a series of five auctions in 1974 and '75. At these sales, many specimens which, for various reasons, were exceptionally attractive to the buyers, brought several thousands of dollars each. The Mackey sales reveal the interest in collecting this fascinating form of folk art. Although collectors and dealers have been gathering what they could find along our North Carolina coast for years, it is still possible to uncover in some old fish house, boat shed or barn, a specimen of a type to bring a thrill to a collector; and rarely, a whole rig remains in the hands of a descendant of one of the old market hunters, but hardly for sale.

Through the years, regional characteristics of decoys have come to be fairly well recognized by collectors. Examples, beginning with the Northeast, are St. Lawrence River Decoys, Delaware River Decoys and Upper Bay (Susquehanna Flats), all of which have strong regional markings. In the midcontinent, the Illinois River and the charming little Louisiana Decoys have distinct styles of their own. Besides having features which are peculiar to the areas of their origin, the decoys of some skilled artisans have such distinctly indivi-

FIGURE 5

FIGURE 1

dualistic styles, that collectors of experience can identify them as positively as the paintings or sculpture of other artists may often be recognized. These are exemplified by the well-known decoys of "Shang" Wheeler, the Ward Brothers, Ira Hudson, and Charles Perdew, to mention only a very few. In our own state, the Dudleys, John Williams, Ned Burgess, Alvirah Wright and Mitchel Fulcher had their own recognizable styles.

This article will present such information as the writer has been able to dig up on some of the early makers of working decoys (used for hunting as differentiated from those used for ornamental purposes) in North Carolina.

At this point, it may be well to digress sufficiently to explain that market hunters were a tough and hardy group who before 1918, when the sale of game became illegal, made their living by selling the waterfowl they killed. Along our coast they did most of their shooting from sink boxes which, with several hundred decoys anchored around them, comprised a "battery rig".

Fig. 1 shows two cast-iron wing ducks which have been repainted to hide the deep rusting which resulted from exposure to salt water. One still hears the term "battery decoy" applied to the large, sturdy wooden blocks which were carved to withstand the severe treatment to which they unavoidably were subjected, and many of the accompanying pictures of old decoys which were made in the Currituck area illustrate the "battery decoy".

Any discussion of North Carolina decoy makers must start with the brothers, Lem and Lee Dudley of Knotts Island (also of Wash Woods and Munden, Va., so it appears they may rightfully be claimed by both states). Both are buried on Church's Island, N.C. The talents of these two carvers have not gone unrecognized, as their outstanding work has been praised in the books of Mackey, Barber, Starr and other writers on the subject. Many of the decoys that they made for their own use may be identified by a distinctive LD branded in the bottom. Mackey said that a B or ELM cut into the bottom was positive identification of decoys they had made for other hunters. When unmarked by initials, the unique style of the Dudleys ordinarily serves as sufficient identification.

Fig. 2 shows a mallard, a pintail, a teal, and a bluebill made by these talented brothers. The pintail (of cypress) is paintless, the mallard has traces of the original paint, while the bluebill has been repainted. The cypress teal (white coated to preserve the wood) was found last winter by Ardell Waterfield, a trapper, in

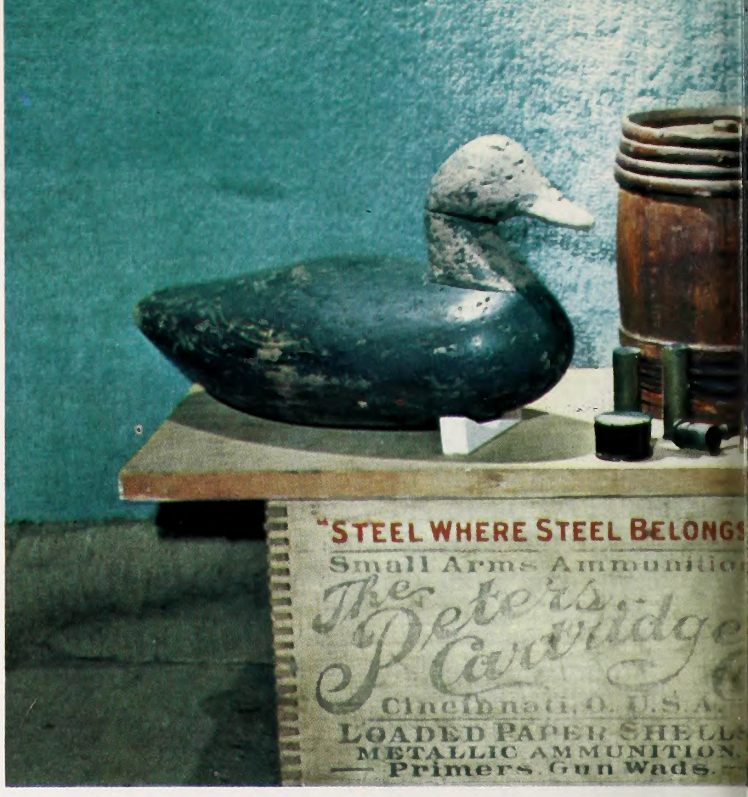


FIGURE 4

Currituck Marsh where it must have lain on its side, almost buried in the muck, for many years.

Besides the Dudleys, another carver of that same Back Bay — Currituck Area whose work has been acclaimed superior by writers and collectors, was John Williams of Cedar Island, Va. He operated battery rigs for himself and for others, in Currituck Sound and Back Bay, and he made many decoys. His ruddies and swans especially, are much sought after by collectors today. It is not possible to fully describe the work of John Williams without bringing up the name of Ivey Stevens, who worked for and with him. It seems probable that Stevens learned to make decoys under the tutelage of Williams, and that he made many of the battery decoys that Williams used in his rigs. There is a marked resemblance in their styles; in fact, the similarity is so great that specimens of the two frequently are confused. Fig. 3 shows a swan and a ruddy by Williams, the two species most avidly sought after by collectors, and a bluebill. Fig. 4 shows a pair of redheads by Stevens which illustrate the similarity in the styles of these two carvers.

In attempting to determing the species of these worn and weathered old decoys, which usually have been covered with many coats of paint, it often is not possible to be positive of what species even the last coat was intended to depict. Just as the Dudleys spread their lives and talents across the lines of both states, so did John Williams and Ivey Stevens operate batteries and scatter their decoys widely through-

FIGURE 6

FIGURE 2

out the fabulously productive hunting area which included Back Bay, Va. and Currituck Sound, N.C.

The literature which has described the waterfowl decoys that were made in North Carolina, pictures them as generally crude, rough and indifferently painted, and the work

FIGURE 3

of Williams and Stevens probably in some respects exemplified these terms if a comparison should be made with the finest products from the hands of the best carvers of our more northerly states. However, instead of crude and rough, they might more fairly have been described as rugged and functional.

Without delicate wing and tail projections, which would have been vulnerable to damage from handling when hunting, they were made to withstand the bruising treatment necessarily received by battery decoys.

A decoy carver from Church's Island who seems to have escaped the attention that he deserved, among the many carvers in the Currituck area, was Ned Burgess (1863 - 1958) of Water Lily. His ducks, which ran the gamut of the various species of both diving and puddle ducks of the area (including coots) were distinguished by a graceful slenderness which often approached elegance. On all of his decoys examined by the writer, the final shaping was done with a rasp, the marks of which remained to show through a paint job which in its muted simplicity obviously was the work of an artist. Collectors are fortunate in that, even today, specimens in original paint by this prolific maker, still may occasionally be found. Without doubt, Burgess should be ranked with the best of our early decoy makers. Examples of his work are shown in Fig. 5. He also made a great many canvas-covered geese.

The name Waterfield is still common in the Currituck area, and Malachi (1833 - 1916) who once lived on Knotts Island, made a great many redhead and blackhead (scaup) decoys for battery rigs. Caleb Geams Waterfield also made battery decoys for other hunters during the latter part of the last century, and it is said that his son George followed in his footsteps in this respect. Reflecting the superstitions of the period, Caleb's wife was accused of being a witch, and this may have led to the tragedy which occurred in the family when George murdered a woman on the island, then later killed himself. The patched up and oft-repainted baldpate shown in Fig. 6 was made by Malachi, whose decoys may be identified by the thin tail that comes straight off of the back of the sturdy body. The pintail in this picture is attributed to George Waterfield.

STEM TO STERN

by Ed Jenkins

PROP TALK

What size propeller is correct for your boat? The one that came with the motor. Perhaps, but not necessarily. For optimum engine performance, a propeller should be matched to how the boat will be used as well as boat size.

The propeller or wheel, as it is often called, converts the torque of the shaft into thrust. The amount of thrust for a given amount of torque is related to three factors: blade area, diameter and pitch.

A three-bladed propeller of a given pitch and diameter will have greater thrust than a two-bladed prop. Two-bladed propellers generally have more sharply pitched blades and are used on boats designed for high speed running and light loads. On large cruisers and work boats where greater thrust is required, a four-bladed prop may be more suitable.

The diameter of a propeller is determined by doubling the distance between a blade tip and the center of the hub. In describing a particular prop, the diameter is always given before the pitch. If a propeller is said to be a 14 x 13 size, it has a 14″ diameter and a 13″ pitch.

Pitch refers to the blade angle of the prop and is measured in inches. The pitch is the theoretical distance a propeller will travel in one full revolution (see diagram). Due to slip loss, actual advance is less. Planing runabouts may have as little as 10 percent slippage while heavy work boat propellers may slip as much as 80 percent.

The propeller that comes with the outboard engine is a standard size for an average boat and load. It may suit your boat fine, but then again it may not. The latest Evinrude catalog of propellers I saw listed 207 different propeller choices for boats between 12′ and 29′ in length.

A tachometer can be very valuable in selecting the right propeller for your boat. By trying a propeller and comparing the engine's top RPM against the manufacturer's recommended range, one can select the propeller that is best suited to his boat. Many marinas provide "user" propellers for this purpose.

If the motor does not reach its rated RPM on the tachometer, it is overloaded and a lower pitched propeller should be tested. If the motor exceeds its top-rated RPM and overspeeds, a propeller of more pitch should be tested. As a rule of thumb, one inch of decrease or increase in propeller pitch will result in a change of about 300 RPM in engine speed.

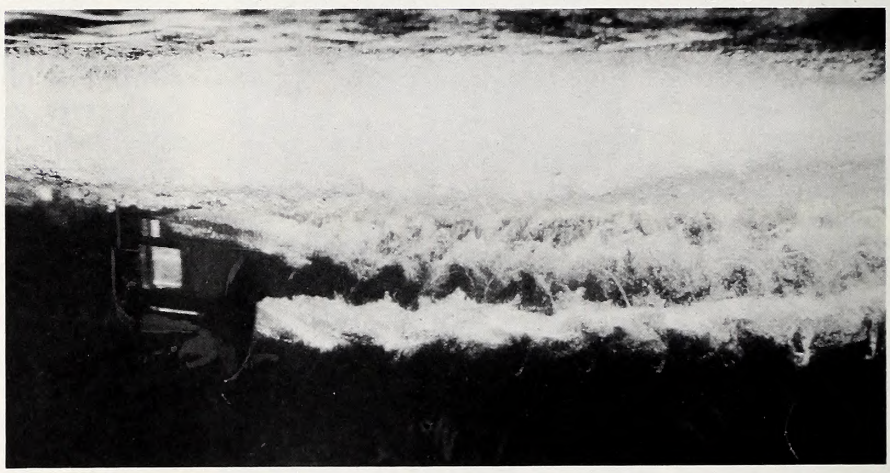
Here are some often asked questions concerning propellers:

Q. I understand why a motor that overspeeds can be damaged, but what damage can occur if a propeller keeps a motor from running at full RPM?

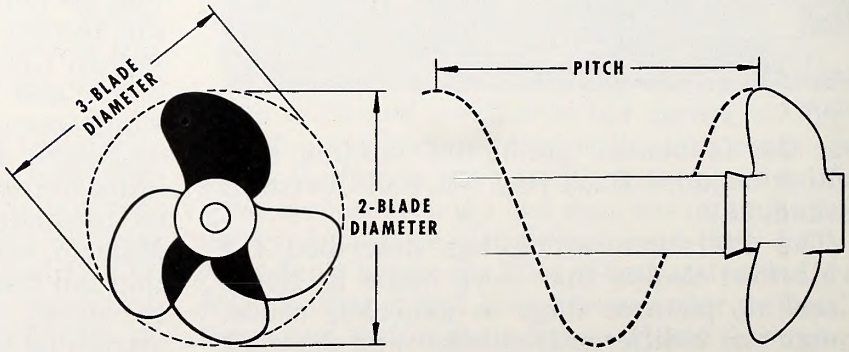
A. When a motor does not reach its rated RPM because of propeller size, the engine is overloaded and under strain. This may result in excessive carbon build-up, poor fuel economy, spark plug failure, scoring of the cylinder walls and burned pistons.

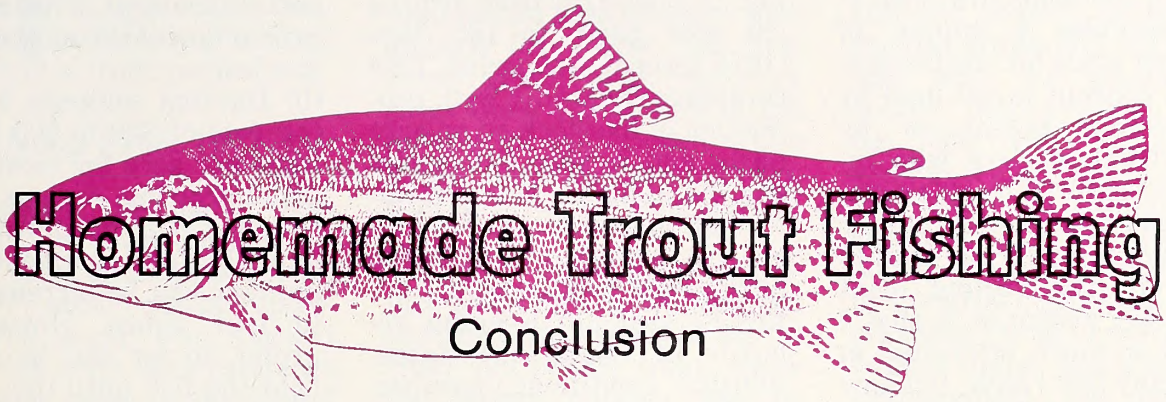
Q. My boat has trouble pulling a slalom skier out of the water. Will a different

Continued on page 27



The spiraling discharge current propels the boat forward. Exhaust gases in the outboard are vented through the hub. Propeller diameter and pitch are diagrammed below. Photo and diagram courtesy of Mercury Outboard Motors.





Homemade Trout Fishing

Conclusion

by Willis King

Last month the author discussed pond construction, stocking and other management phases. The "pay-off" concludes the story.

Fishing: My primary reason for having a trout pond was to provide recreation and secondarily food. These are compatible objectives and are directly related.

Fishing was started after the fish had been in the pond for about a month. This period allows the fish to get adjusted; they behave more as wild fish and acquire some natural color. During the summer, trout could readily be taken on a Mepps spinner. Skilled trout fishermen could take the fish on flies, and various other lures were effective at times. Fishing was generally best in early morning, but late afternoon fishing was also effective. During the mid-day the sun strikes most of the pond, and the fish were in deepest water, and harder to entice to a lure during those hours.

After several months of exposure to artificial lures, the fish became harder to catch. Earthworms were usually accepted, and whole kernel corn was a standard bait. Pond fish, like stream fish, may show complete lack of interest in any lure or bait, and at the most disconcerting times. The fishing was entirely recreational, with no permits sold, and limited to family and friends. There are commercial trout ponds in the area, which made it easier to limit the fishing at the King pond.

Complete record of all fish removed from the pond was kept for each of the three years. All fish taken were weighed in lots by species. Many were measured for length, and stomachs briefly examined to see if natural food was included in the diet. Frequently, both plant and animal remains were noted. The fish became deep bodied as the season progressed, and more brightly colored. Brook trout developed red spots, and mature males developed the deep orange breast and belly. Rainbows showed all degrees of brilliance, some equal to any wild fish I have seen. Mature males developed the typical hooked lower jaw. The flesh was firm, and the fish were very strong when hooked. A 2-pound rainbow could readily snap a 4-pound test leader, unless the fisherman used skill and a landing net.

Trout stocked in mid-April at a weight of 1/4 to 1/3 pound weighed up to two pounds by early October. The largest specimens recovered were in the 1976 class, where four rainbows reached 2 3/4 pounds each, and one adult male brook trout reached two pounds. These larger fish were 15 to 16 inches in length. Some rainbows had ripe gonads, others of equal size showed little reproductive development. There may have been more than one strain of rainbows involved, affecting both growth rate and sexual maturity. Fishing definitely was good.

Drainage and recovery of trout: One of the management procedures followed was annual lowering of the pond and retrieval of all remaining fish. The optimum time for this has been the last half of October, after about six months in the pond. This procedure enables

The author enjoys a summer afternoon's fishing in the pond. The trout aren't always cooperative.

a complete record of gain during the year and brings the season's operation to a close. It also provides a supply of excellent trout for the freezer.

This concept is not held by the average person, or by many trout anglers who invariably ask, "Why don't you leave the fish in over winter and have some larger ones to start off the fishing next year?" My response is that I am not so much interested in how many fish I have, but how many trout, of desirable size and condition, I can economically produce and harvest in a season. By draining the pond, I avoid over-winter losses which are always hard to account for, there is no unauthorized or unreported fishing, and I do not have concern for what goes on in the pond when I am absent during the winter.

This concept that fish can be most efficiently handled as an annual crop is not generally understood. To me, it is relatively simple and embodies fewer pitfalls than any other plan. I know of ponds where trout are left year around, and the occasional large trout thrills the angler, but production is low, unpredictable, and there are recurring losses of fish from unexplained causes.

There is invariably an unexplained loss of fish from numbers stocked to numbers recovered. Fishery managers expect this, but hope it will be small. This loss was greatest in brook trout, 17% in 1974 and 24% in 1976. Rainbow losses were appreciably fewer, 7.4% in 1975 and 8.3% in 1976. Possible sources of loss were unobserved disease, predators (including unreported fishing), and escape from the system in high water. Should the fish be carried over winter, I would expect these losses to be much higher.

A brief statement on productivity is in order. A maximum crop of 400 pounds (lacking .5 pound) of trout from a .20 acre pond, in 185 days (1976 record) is reported. This compares favorably with production of livestock on an acre basis, and raising fish is less trouble. This is not new information, but accurate data are not always available for purposes of comparison.

Record keeping: Keeping records of important dates, unusual conditions, number, species and weight of fish caught or removed from the pond is very valuable and adds interest to the operation. It takes little time.

One part of record keeping relates to environmental conditions. Temperature is readily recorded and provides valuable clues to fish growth and behavior. I did not take temperatures every day, rather only when I thought unusual highs might be expected. The stream is well shaded throughout its course. Inflowing water goes to the bottom of the pond and gradually rises as it warms. There is considerable movement by wind also. The temperature six inches below the surface, at one point along the shore, was taken periodically, in addition to the stream and air temperatures. These have remained favorable over the three-year period.

In his book "Homemade Fishing" Verne Davison (1953) has only one brief chapter on "Growing Trout in Ponds". Even so he deals with the same basic problems pond owners face today, and there is surprisingly little new information that has come to light since that time. Most of Mr. Davison's proposals are sound, but on some I would differ. Specifically:

(a) I would not mix trout with other species. There is too great a possibility of introducing diseases and parasites, and competition for food is certain to occur. This reduces production of the most desired species.

(b) Davison suggests a stocking rate of 300 to 500 fingerlings per acre for most of the trout growing regions of the country. With good water and a regular feeding schedule this number can be increased two to four times. However, I prefer to let the hatcheries hold the fish until they are at least a year old, and the heaviest losses have been assumed. By this time the fish should be not less than 6 inches in length (about ten per pound). I found that trout in the 8 to 9 inches length range (weighing four to three per pound), were an ideal size for rapid growth and weight increase. Fishing can be started months sooner, and the pond space is fully utilized as the season advances.

(c) Pelleted feeds are now available, removing much of the labor and mess formerly required in feeding trout. Present-day feeds may be more expensive, but they are worth the price in convenience. Several brands that do not require refrigeration are available, depending on location.

(d) Light feeding does not always make the fish bite better. My fish consistently refused lure or even natural baits when pellets were available at the same time. Early morning fishing, before any feeding, gave the fastest returns.

(e) Davison, in his description of water supplies, states, "You need no run-off." This is a cardinal principle in a warm-water pond that is fertilized, but may not be the best arrangement for a trout pond. It is true for flood waters or for silt-laden waters, but if the surface water approaches a

maximum safe temperature (75°F.), some excess of inflowing water, if it is cooler than the pond surface, is a decided benefit in a trout pond.

Some Notes From 1977

Although this paper was written to cover only three years, some observations from the 1977 season can be reported. The pond was stocked April 26 with 200 rainbows weighing three to the pound and 100 brook trout at four to the pound (total 91 pounds). The fish were slower in taking feed this year, especially the rainbows, but the latter caught up by mid-August. The summer of 1977 will long be remembered for its protracted heat and low rainfall, which was about one half the normal in May and June, and only 1 inch in July. The stream water reached 65°F. on several late afternoons, but dropped to the low sixties at night. The pond surface became too hot for the fishes comfort, reaching 76°F on several afternoons. However, there was no observed mortality and the brook trout crowded into the pond inlet, seeking the cooler stream waters. The fish grew extremely well and weighed about 1 pound each by August 1, with a few of both species weighing 1½ pounds by mid-August.

Water from a deep well was used as a supplemental supply on a few days, to help hold down temperatures. It was mixed with the stream water and well aerated. Final records and observations for the season are not available at the time of completing this paper.

Conclusions

Man-made trout fishing is feasible, economical, and rewarding in recreational opportunities that it provides.

A small impoundment (.20 acres) constructed in 1974 maintained a satisfactory production level over the first three years, with recovery rates from 81% to 86% of the number of fish stocked; while weight increases ranged from 83% to 170%, combining both species.

Annual stocking is recommended, April is the favored month. Stocking rates varied from 400 to 500 trout, while the larger number can be supported by a full feeding schedule, about 400 trout from 8 to 9 inches in length are adequate to meet my needs for trout and trout fishing.

Choice of species is up to the pond owner, but in my pond rainbows made the best growth and had the lower percentage of loss. In the years where rainbows alone were stocked (1975) and where they dominated the brook trout (3 to 1 in 1976) 90% of the stocked rainbows were recovered over a six months' period. Brook trout (ratio 7 to 1 rainbows in 1974, and 1 to 3 in 1976) suffered losses of 17% and 24% respectively in the two years. Their weight increase was also less favorable than the rainbows (Table 1).

Both species took to artificial feeding equally well, became beautifully colored by autumn, and many showed full development of ovaries and testes. The ripening of the ovaries in brook trout in late September and October, affected the condition of their flesh and made them less desirable. This suggests that the optimum time for taking brook trout is not the fall spawning season. No difference in catchability of the species was observed.

One hypothesis which I have maintained is that trout can and should be handled as an annual crop, that the pond should be stocked in the spring of the year with sub-adults (8 to 9 inches in length and 3 to 4 fish per pound). At this size, the fish are about 1 1/2 years of age, and the smaller and weaker fish have been graded out. Survival is high, and growth rate rapid. Fishing can be enjoyed throughout the summer. Further, the pond should be lowered near the end of the growing season and the standing crop recovered. I believe under this schedule of management, the maximum number of trout are recovered, and the greatest production in pounds of fish realized. My results over the three year period bear out the desirability of this regimen.

This is largely a case history of one pond in a fairly typical situation. The same degree of success would not necessarily follow in other locations or with different techniques of management. The guidance of a professional fishery manager, who knows something about trout and their requirements, will likely spell the difference between mediocre success or failure and a satisfying venture. Once mastered, the operation is more nearly predictable. I would agree with Verne Davison's conclusion that "The most efficient production of trout now, comes with pond-management in which the fish are stocked and harvested in a single year."

The author was Principal Fishery Biologist with the N.C. Division of Game and Inland Fisheries 1940-49 with two years in the U.S. Naval Reserve.

Director and Asst. Director, N.C. Wildlife Resources Commission 1947-49.

Fishery Management and other duties, U.S. Bureau of Sport Fisheries and Wildlife, 1951-1973. Retired June, 1973, as Asst. Director for Cooperative Services.

Attracting Wildlife FOR FUN AND PROFIT

by Emily Grey

There's a relatively new activity that's sweeping the nation. People are taking pride in "exterior decorating" or backyard wildlife management. Now, one doesn't have to venture into the woods, fields, and streams to see wild animals. With a little ingenuity, know-how, and patience you can attract quite an array of wildlife to your property. Suburban and urban residents, too, can attract certain kinds of wildlife to their homes and apartments.

Why go to all the trouble? Economically speaking, by enriching the vegetation, thus, wildlife, around your home, property values will increase as much as 3 to 10 percent. Even if you don't plan to sell your home, by developing this haven for wildlife, you've greatly enhanced the beauty and pleasantness of your surroundings.

How do I attract wildlife? It is important to acknowledge that all wildlife have four basic survival needs: cover, reproductive areas, water, and food. Naturally, different animals require different types of these four survival necessities.

Cover — is any place that protects animals from the weather and from predators. Trees, shrubs, flowers, brush piles, rock piles, and artificial shelters can furnish cover.

Reproductive areas — all wildlife need concealed places to raise their young safely from predators and the elements. Many of the same trees, shrubs, and flowers that provide cover can serve as reproductive areas also. You can arrange additional places for birds and other animals to nest.

Water — fancy waterfalls and pools are very decorative, but you don't need to go to great expense. A standard bird bath, large bowl, or garbage can lid will suffice for holding water. By keeping the container clean, you will attract more visitors. A water-filled bucket with a hole in it or the steady drip of a hose will entice wildlife from far away.

Food — some wildlife prefer seeds, fruits, grass, leaves, or insects. Food can be grown naturally or furnished artificially at wildlife feeding stations.

When should you begin this Eden for wildlife? Start immediately, but first of all make a plan.

1. Make a scaled diagram of your property's dimensions. Include everything: the house, walkways, and other permanent structures, but exclude plants. Make several copies.

2. Fill in one copy with current plants down to the types and precise locations of flowers and grasses. This is your "before-look."

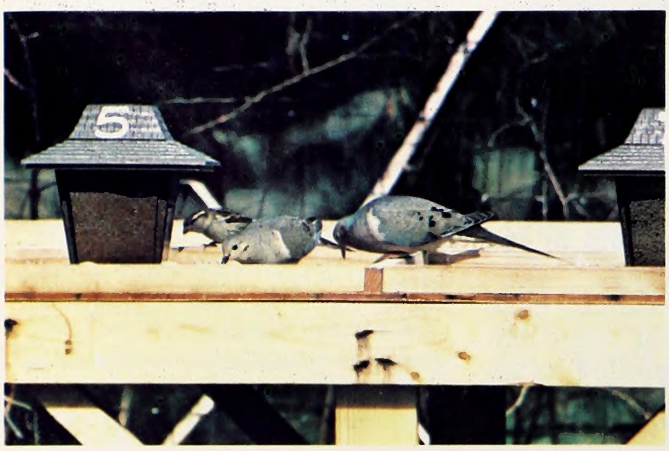
3. Sketch in those new types of plants you intend to procure. This is the new look. Don't rush it. Make notes on ideas that appeal to you.

How much will it cost? You can spend as much as you desire. However, there are ways of economizing.

1. Do the work yourself; don't hire it done. Gardening in this manner can be immensely rewarding, and you can save a fortune by doing the work yourself.

2. Know your soil before planting. Your best bet for a

Although these feeders were used for a study of the usage of various feed mixtures by a variety of birds, similar seed dispensers are fine for the amateur bird watcher and wildlife enthusiast.



reliable and usually free soil test is to contact your county agricultural agent.

3. Take into account the size of your yard, and don't overdo it. You can create a jungle of shrubbery so as to exclude certain animals. Every plant chosen should serve a purpose. Select the types of plants that can best fit the role and locate them properly.

4. Acquiring plants from friends, neighbors, and relatives saves on the high cost of purchasing from nurseries and many mail order catalogs.

5. Keep an eye open for new developments such as shopping centers, road construction, etc., and get in touch with the owner. Chances are you'll strike a good deal on plantings about to be disposed of.

The greater variety (types, ages, sizes) of vegetation on your property, the greater variety of wildlife you will attract. One cannot be too careful in selecting plants. Often exotic or nonnative plants outcompete indigenous or native vegetation, creating a "plague" of massive growth.

If you already have a pond or decide to have one dug, let nature fill in the vacuum. Money can be saved in the long run by not restocking in which you might be overrun with animals or suffer an overkill. Nature can best regulate animal populations.

Artificial feeding can be administered year 'round; however, it is of most importance to wildlife during severe winter months when the natural food supply is much less abundant. Once artificial feeding has begun, it is vital to continue it. With artificial feeding you increase the carrying capacity or maximum wildlife concentration on your property. If you were to stop feeding, chances are a heavy overkill would result.

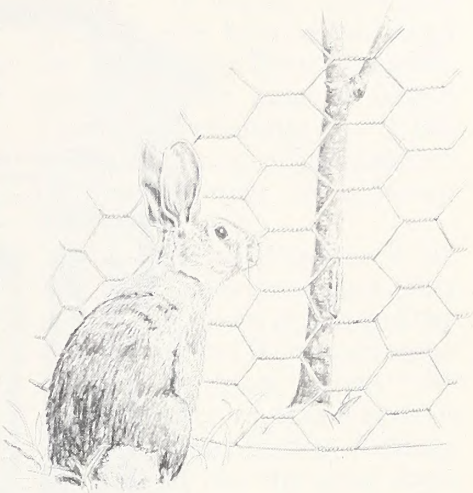
To maintain your mini-refuge, you will have to devote some minimal time and effort. I encourage you to be a bit sloppy.

1. Don't be too hasty to cut all weeds, grasses, and shrubs along the edges of your yard. These plants provide ideal nesting areas, cover, and food.

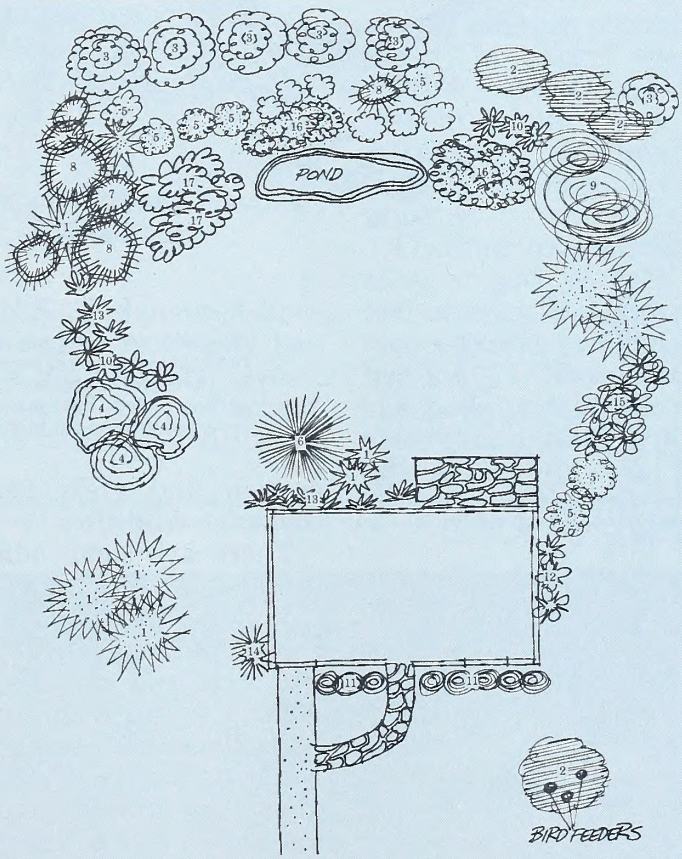
2. Leave dead trees since they offer homes that are preferred by many wildlife species.

3. Don't be so quick to prune branches which are also ideal for bird nesting and perching sites.

4. Plant erodable or waste areas in materials that control



Once you've succeeded in creating a good place for wildlife to live, you may be confronted with problems of keeping species such as rabbits away from plants you don't want damaged.



Backyard Wildlife Habitat Planting Plan

This drawing will give you an idea of how to plan your wildlife oasis.

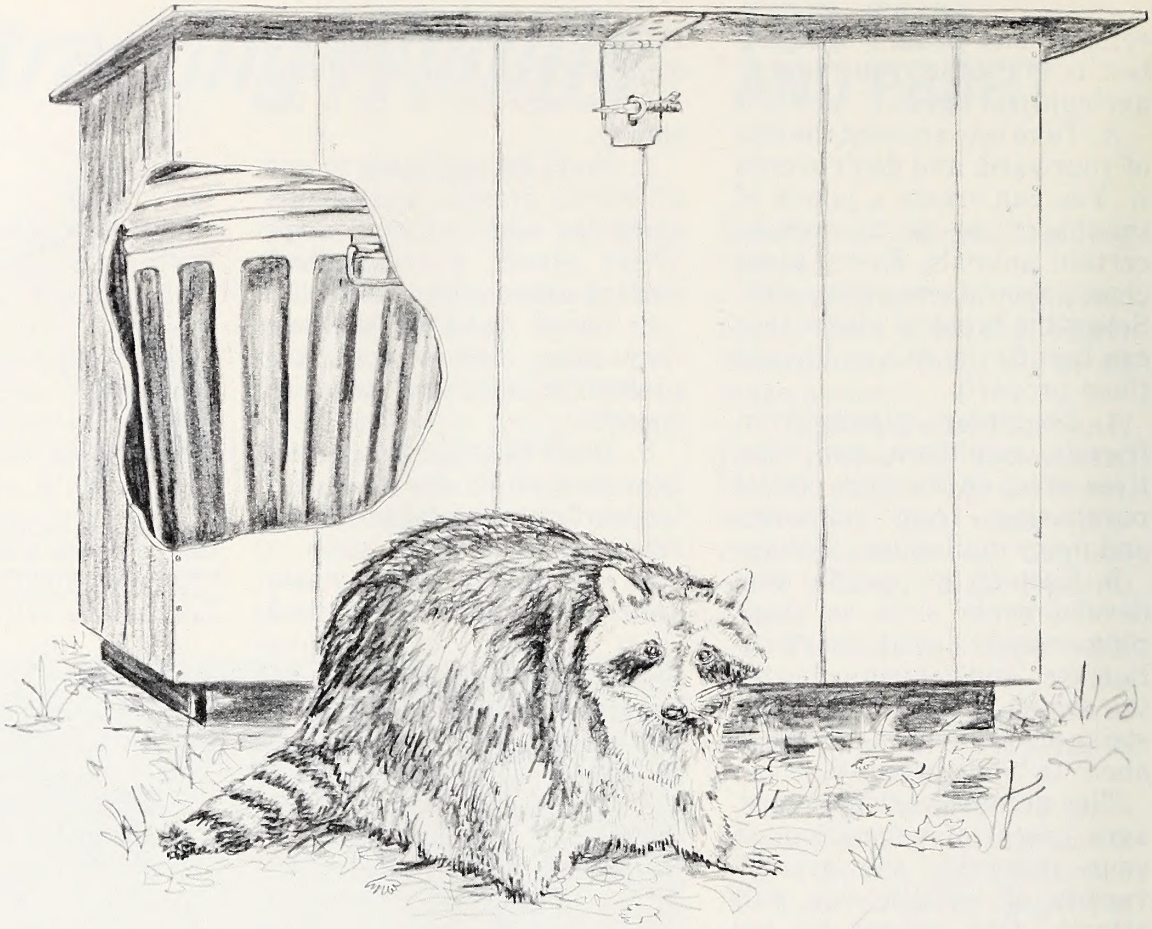
Large Trees - (1) beech; (2) holly; (3) white oak; (4) red maple; (5) white pine; (6) white spruce; (7) hemlock.

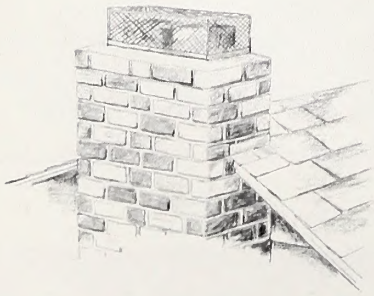
Small Trees - (8) mountain ash; (9) flowering dogwood; (10) crabapple.

Large Shrubs - (11) winterberry; (12) downy serviceberry; (13) autumn olive; (14) viburnum; (15) elderberry.

Small Shrubs — (16) blackberry; (17) silky dogwood.

Flowers might include asters, daisies, marigolds, petunias, black-eyed Susan, and sunflowers. Planters and beds should be scattered.





Raccoons are notorious garbage can robbers and it may be necessary to construct some sort of enclosure to keep the bandits from helping themselves. Be prepared for increased numbers of birds in the cherry trees. Light-weight netting (below, left) should help. Chimneys and other such openings can be screened to keep out birds that prefer this type of roosting place (lower left).

erosion and yield food and cover for wildlife.

There are some additional things that could go wrong.

1. Some birds (house sparrows, starlings, flickers) and squirrels and racoons prefer nesting in attics and garages. Cover louvered openings with heavy mesh screen which will allow for ample ventilation and keep unwanted animals out.

2. Eaves beneath roofs are often house sparrow nesting sites. Fill these in with wooden angles.

3. Scarecrows don't serve the purpose. Alternate scaring devices every few days and change their locations.

4. Often live trapping is the solution for removing undesirable animals.

5. If poisoning is mandatory, check with wildlife commission officials and leave it to the professionals.

Some words of warning: Don't try to pet or torment wild animals. They do contract diseases, some of which are communicable to humans. Post your land and seek the cooperation of neighbors.

Is this backyard experiment worth it? I would emphatically say yes. Your wildlife area should be rewarding educationally, aesthetically, and recreationally. It should build toward a greater understanding not only of wildlife but also of man. After all, we, too, live and fare in relationship to the earth. It, too, provides us with cover, food, water, and living space.

ENVIRONMENTAL BRIEFS

• The Little Tennessee River in Swain and Macon Counties has been designated as critical habitat for the spotfin chub, which in the same action, was officially designated as threatened by the Office of Endangered Species of the U.S. Fish and Wildlife Service. The notice, which appeared in the September 9, 1977 issue of the Federal Register, prohibits the taking or possession of the spotfin chub except by special permit.

Critical habitat designation requires that federally funded programs in the vicinity of the river not have any adverse impact upon said habitat. Most likely adverse impact, in this case, consists of any action which would contribute to the silt load of the river. Federal highway construction projects, urban renewal programs, and timber cutting operations within the Little Tennessee drainage basin are some examples of programs that could be curtailed if insufficient attention is given to control of erosion and stream sedimentation.

The drainage basin is primarily in Macon and Swain Counties and extends from the headwaters of the Little Tennessee River at the Georgia state line downstream to Fontana Lake. The rule becomes effective October 11, 1977. The Wildlife Resources Commission, by cooperative agreement, shares surveillance and enforcement responsibility with the U.S. Fish and Wildlife Service.

Profit and Loss

Dozens of integrated pest management program field managers, who have worked with biological and other nonchemical pest controls over six years for the USDA, have been interviewed by Friends of the Earth researcher Erik Jannson. His conclusions: Extra profits from less chemical use ranged from $6 to $1,000 per acre; biological control expenditures return $30 to the farmer for every $1 spent on research; the citrus industry's investment of $35,000 a year in biocontrols has saved it $35 million a year.

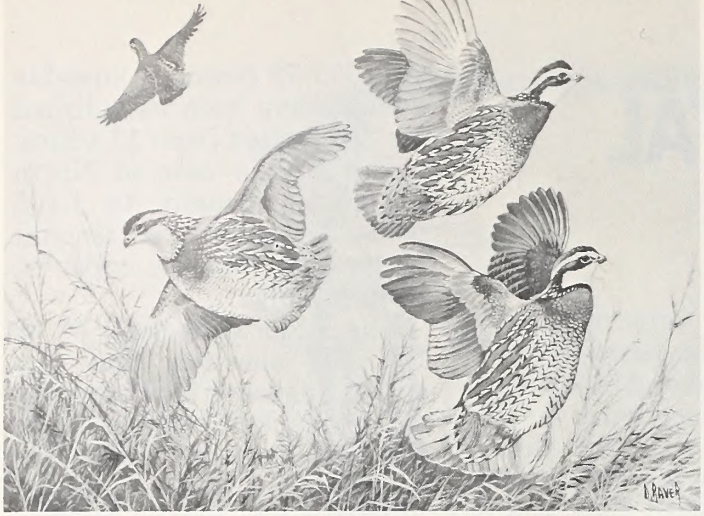
Export of Certain Species Curtained

The U.S. Endangered Species Scientific Authority has made a preliminary determination that export of bobcat pelts will be prohibited during the 1977-78 season. Allowable quotas have been established for river otter from 17 states, which in the case of North Carolina, amounts to 1,195 pelts. An unspecified amount of ginseng may be exported from Michigan.

The Federal Register V. 42 No. 168 specifies that this action was taken to prevent the export market from having an adverse impact upon the survivability of these species in the United States. Neither the bobcat nor the otter have been designated as endangered or threatened in North Carolina but increasing demands by foreign markets may require the establishment of pelt tagging procedures in order to more accurately monitor the take. At the present time there is no regulatory mechanism in North Carolina to protect ginseng.

Pending regulations would allow export of both bobcat and otter pelts caught in previous seasons prior to November 1, 1977. No export of bobcat pelts would be allowed after that date.

According to pending national legislation, export of bobcat pelts would not be allowed after November 1, 1977. This would afford this species added protection.



WILDLIFE ART SHOW

A wide variety of techniques and materials were represented in the 1976 Art Show. The top award winner (right) was painted by Marlene Loznicka of Garner. A painting will be selected by the N.C. Wildlife Federation to succeed last year's Art Print of the Year winner, bobwhite quail (above) by Duane Raver.

The Wake County Wildlife Club Art Show is scheduled for December 1, 2 and 3, at the North Hills Shopping Mall in Raleigh, N.C.

This popular annual wildlife art show is becoming the most recognized display of its type in the U.S.A. and this year's show will be bigger and better than before.

The purpose of the show is two-fold; to display and sell the finest wildlife art available and to raise money for worthy recipients in the fields of wildlife sciences and conservation. Twenty percent of each sale will be retained by the Wake County Wildlife Club to provide scholarship help in these fields.

All entires must be of wildlife, realistic treatment of the subject and in suitable habitat if called for and be of species common, or native, to the United States. No abstract art will be accepted; however, stylized realism will be acceptable but subject to consideration by the acceptance committee. Any art not selected for showing by the committee will be returned promptly to the sender, collect. All art submitted must be priced and be available for sale during the show.

A panel of distinguished and qualified judges will determine the awards winners prior to the opening of the show and ribbons will be attached to identify the winners and the grade of award at the show opening. The wildlife painting selected by the judges for top award in the competition will be reproduced in *Wildlife in North Carolina* if compatible with standards of proportions, design and treatment. The original is returned to the artist or purchaser after use.

This year the N.C. Wildlife Federation will make a special selection from all paintings entered to pick the WILDLIFE PAINTING OF THE YEAR. In previous years this selection has been made during the Federation's Annual Convention to provide a top quality painting which could be used for reproduction as a limited edition print, signed and numbered by the artist. This year the selection will be made during the Wake County Wildlife Club Art Show instead. The painting selected, after agreement with the artist, will become the property of the N.C. Wildlife Federation who will have high quality art reproductions made from the original, size 16 x 20, in a limited edition as before. The artist will receive $200 for the painting plus a block of 200 prints which he can sell or dispose of as he wishes. Art Prints-of-the-Year go to each Sustaining Member of the Federation who contributes $35 or more for a one year membership. In addition, the painting will be reproduced on the cover of *Friend O'Wildlife* magazine early in 1978.

Information, entry forms and rules are now available to artists interested in exhibiting and selling their works. Write to Rex Gary Schmidt, Chairman, Wake County Wildlife Art Show, 3700 Trenton Road, Raleigh, N.C. 27607.

The Duck That Whistles

by Suzanne Austin Browne

The melodious whistling sound which you may hear descending from the Carolina sky could be emanating from an infrequent visitor formerly known as the fulvous tree duck. Recently the tree duck was renamed fulvous whistling duck, a name more appropriate for two reasons. Obviously, the first reason is its distinctive whistling sound. The second is that a few of the birds perch or nest in trees. Fulvous whistling goose would also be a suitable name because the nine species of tropical and subtropical whistling ducks are more closely related to swans and true geese than to ducks.

The tawny-headed, dark-winged whistling duck has long legs and large grey-blue feet. The bird, an excellent diver, usually feeds in rice fields, shallow marshes and occasionally in cornfields.

The range of the nine species of whistling ducks extends from Ceylon, India, Madagascar, and East Africa, to northern and eastern South America, Central America, and the southern United States. The species found in the United States winters in Mexico and in smaller numbers on the southeast coast from Florida to Virginia. It nests in northern Mexico, Texas, southern California, Arizona, Louisiana and Florida, where it builds its small, downy nest in rice fields and marshes. The nest can either float freely or attach to growing plants.

Fulvous whistling ducks form permanent pairs and the male assists in rearing the young. The female lays from 10 to 16 eggs which hatch in 24 to 26 days. Egg losses are high because of desertion and flooding. The young are able to fly in about two months after hatching.

The fulvous whistling duck has been observed in North Carolina in every month except September. It is most often observed during the winter from December to February and during the spring from April to late May. Previous to 1960 there were only three records for the State; but in 1960, 1965, 1974 and 1975 large numbers (over 100) were present in the State.

BOOK REVIEWS

"The Swamp Angel" by James Bruce Eure, $6.00, The Exposition Press, Inc., Jericho, N.Y. 11753

James Bruce Eure is a Whiteville, N.C., attorney and his love and respect for the out-of-doors clearly comes through in his interesting book, "The Swamp Angel." Although the locale, a southern hardwood swamp, is a fictional place, author Eure most certainly has based the region on one or more areas which have played a significant role in his outdoor life.

The book comes through as perhaps something out of the past, and yet it addresses issues facing each one of us today, right here in North Carolina. "The Swamp Angel" perhaps isn't for everyone, but for those who secretely dream of escaping into an wildlife adventure-filled eastern North Carolina swamp, it should be a welcomed book.

"North American Big Game," Edited by Wm. H. Nesbitt and Jack S. Parker
$25.00, National Rifle Association Publications Division,
1600 Rhode Island Ave.,
NW, Washington, D.C. 20036

Compiled by the North American Big Game Awards Program staff from data in the records archives, this is the official records book for outstanding native North American big game trophies. But it really is much more with sections on various phases of big game management, interrelations of big game species, and reproductions of Robert Thom's magnificent paintings of six of the big game record animals shown in the exact location in which they were taken.

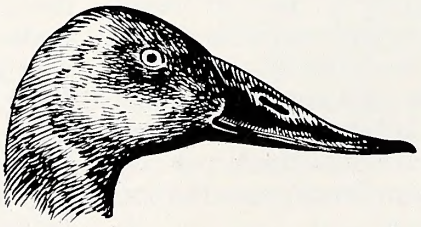
It is a quality publication, well illustrated and carefully constructed.

"Deer Hunting" by Charley Dickey
$3.95, Oxmoor House, Inc.,
Book Div. of the
Progressive Farmer Co.
PO Box 2463,
Birmingham, Alabama 35202

It's doubtful if you could carry all the books and magazines that have been written on the sport of deer hunting, even with an oversized game bag in a 48 stout hunting coat. But every now and then comes along one which gets back to the helpful "nuts and bolts" of this intriguing and often frustrating fall and winter pastime. Charley Dickey has put together this 110-page book from his own vast knowledge and long-time experience in hunting the whitetail, plus the expertise of quite an array of nationally known hunters. It's well illustrated and should be a big help to the beginner and old-timer alike.

BACK OF THE BOOK

- Letters
- Comments
- This & That



Canvasback Society Formed

For the first time, a national conservation organization has been formed solely to benefit one particular species of sporting waterfowl.

Called the Canvasback Society, the new group has as its purpose "to conserve, restore and promote the increase of the canvasback species of duck on the North American continent."

While the group is putting heavy emphasis on the formation of a highly qualified Technical Committee to oversee a research effort, the overriding purpose will be to determine and follow a plan of practical application that will get results. According to the group's president, Keith C. Russell, "It is not our intention to merely launch yet another research effort — we want to find out what we can *do* and then get it done."

The organization's address is P.O. Box 101, Gates Mills, Ohio 44040 and all interested persons are invited to inquire.

Wildlife, Outdoors on T.V.

Fishermen and hunters will have the chance to ask top state officials questions about the state's hunting and fishing program on Carolina Call In November 21 at 7 p.m. on the University of North Carolina Television Network.

Viewers can call questions into a panel of officials on a toll free number, 1-800-662-7030, during the show. The show is one of a six part series sponsored by the UNC-TV network and the Department of Natural Resources and Community Development.

Bob Hazel, director of the Wildlife Resources Commission; Jim Dean, Assistant Editor, "Wildlife in North Carolina" magazine; and Ed McCoy, Marine Fisheries Commissioner will be the panelists. Howard N. Lee, Secretary of Natural Resources and Community Development will be

the moderator.

The first show on October 24 was on the N.C. Zoological Park in Asheboro. Panelists included Bill Hoff, who is zoo director. He brought several animals with him and a film on plans for the zoo.

The environment was the featured topic on October 31. Panelists were W. E. Knight, director of the Division of Environmental Management; Anne Taylor, chairperson of the North and South Carolina chapter of the Sierra Club; and Larry Wallace, special legal assistant secretary for Community Development; and Harvey Lincoln, director of Community Employment.

Stations on the University of North Carolina Television Network are: WUNC-TV Chapel Hill Channel 4; WUND-TV Columbia Channel 2; WUNE-TV Linville Channel 17; WUNF-TV Asheville Channel 33; WUNG-TV Concord Channel 58; WUNJ-TV Wilmington Channel 39; WUNK-TV Greenville Channel 25; WUNL-TV Winston-Salem Channel 26.

assistant to Secretary Lee.

"The Great Outdoors" will be November 7th's topic. Panelists will include Jim Stevens, director of Parks and Recreation; and Jan Truitt, Eno River Park ranger.

The November 14 show will be on forestry. Panelists will include State Forester Ralph Winkworth.

A special show for persons interested in local government, housing and jobs will be the final episode of the series on November 28. Panelists will include Eva Clayton,

PROPS

from page 16

prop help?

A. Probably yes, unless the engine is just too small. A lower pitched propeller will give greater acceleration and thrust to get a skier on top and boat on plane. However, the lower pitched blades may cause the engine to overspeed when cruising at light-load, high-speed situations. Keep an eye on the tachometer.

Q. In a tight turn my outboard will sometimes make a high-pitched racing whine and the boat will lose speed. What is the cause?

A. The phenomenon you are describing is called *ventilation*. This is caused when air gets into a propeller's blade area. With no water to push against, the propeller races around without producing any thrust. Ventilation can be caused by sharp turns, wrong motor tilt angle, too high transom setting and configuration of the hull bottom. If you have a power tilt/trim unit on your boat, make sure the engine is in the full "down" position before making a sharp turn. If that doesn't help, then reduce your speed and widen those turns. When ventilation occurs, the immediate remedy is slow down the engine and let the blades bite into the water again.

Q. Is a stainless steel propeller worth the extra cost?

A. Depends. Aluminum props are certainly much cheaper and perform well in obstruction-free water. However, if you are having to replace your blade every boating season, a bronze or stainless steel one may be cheaper in the long run. Manufacturers of the teflon-coated stainless steel blades claim their props give increased strength, speed and fuel economy. The price is two to three times that of an aluminum prop.

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Carolina Woodies

Wood ducks explode from a brushy North Carolina river in this exciting scene reproduced from a painting by G. Michael Smith. The North Carolina Chapter of Ducks Unlimited had a limited edition of 150 lithographs produced in 18 by 14 inches (image) size. These have been consigned to local DU chapters for sale at their local banquets this winter.

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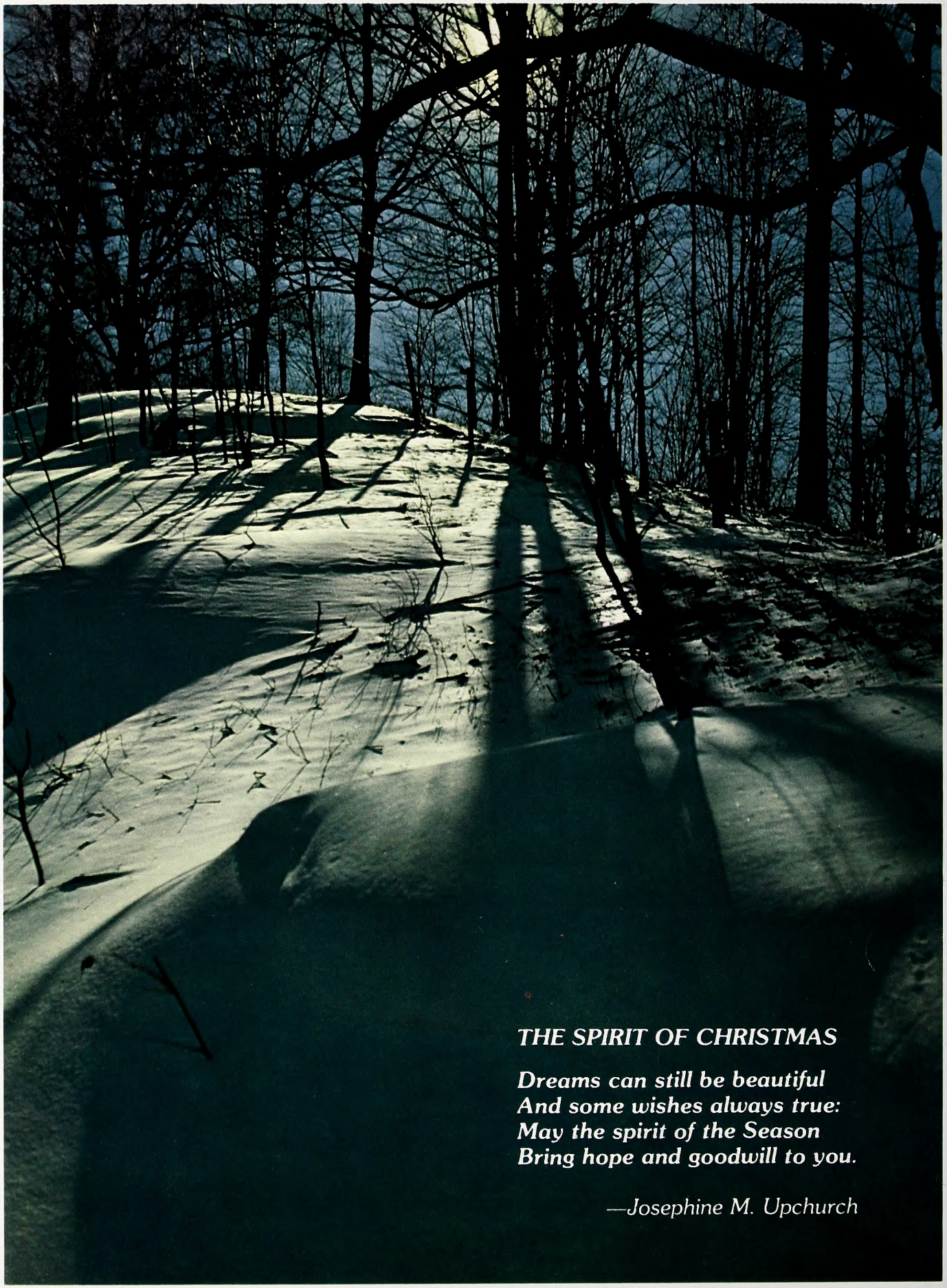
Wildlife

IN NORTH CAROLINA DECEMBER 19



THE SPIRIT OF CHRISTMAS

Dreams can still be beautiful
And some wishes always true:
May the spirit of the Season
Bring hope and goodwill to you.

—Josephine M. Upchurch

State of North Carolina
James B. Hunt, Jr.
Governor

Department of
Natural Resources and
Community Development

Howard N. Lee
Secretary

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VOL. 41 NO. 12 DECEMBER, 1977

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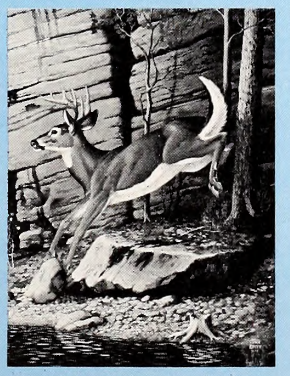


Most deer won't give the hunter a clear view like the buck on this month's cover. The scene is probably a rocky creek bed at the base of a steep outcrop. The buck's hoofs spread for better traction and the muscular legs absorb the jolt of each jump. A well-conditioned deer is a model of stamina and speed. All of its senses are finely honed, making the whitetail an extremely alert animal. Painting by Chuck Ripper, Huntington, West Virginia.

PHOTO BY FRANK MOONEY

Tagging Tells the Story

Want To Know Where and How North Carolina's Big Game was Harvested Last Year? Read on . . .

The figures are in from the first year of mandatory tagging for all big game species in North Carolina. During the 1976-77 hunting season, 23,184 white-tailed deer were tagged, along with 89 black bear, 21 wild boar and 141 wild turkeys.

"The tagging of all big game harvested in North Carolina represents a big step forward in the State's game management program," said Bob Hazel, executive director of the NC. Wildlife Resources Commission. "Tagging, and the resulting information from the big game harvest reports, can give us the kind of concrete information we have been needing to ensure that the proper regulations, research, management and enforcement are applied for each part of the State."

While the number of tagged species and the harvest reports shown here from the first year may not represent the full harvest across the State, the information received is very useful to game biologists. Also, it is anticipated that as the mandatory tagging requirement continues from year to year, the number of hunters who fail to tag their kills will drop drastically.

"We certainly hope that hunters will go to the extra trouble to make certain their kills are tagged, not simply because it's required by law, but because tagging can help big game populations and the hunter," said Hazel. "Tagging provides us with essential information, and the more we know, the more we can do for our big game species."

Take a look at the tables. Which table reflects the big game species you bagged? What! You mean you didn't tag yours? Well, make up for it this year. We need this information.

State-wide Turkey Kill

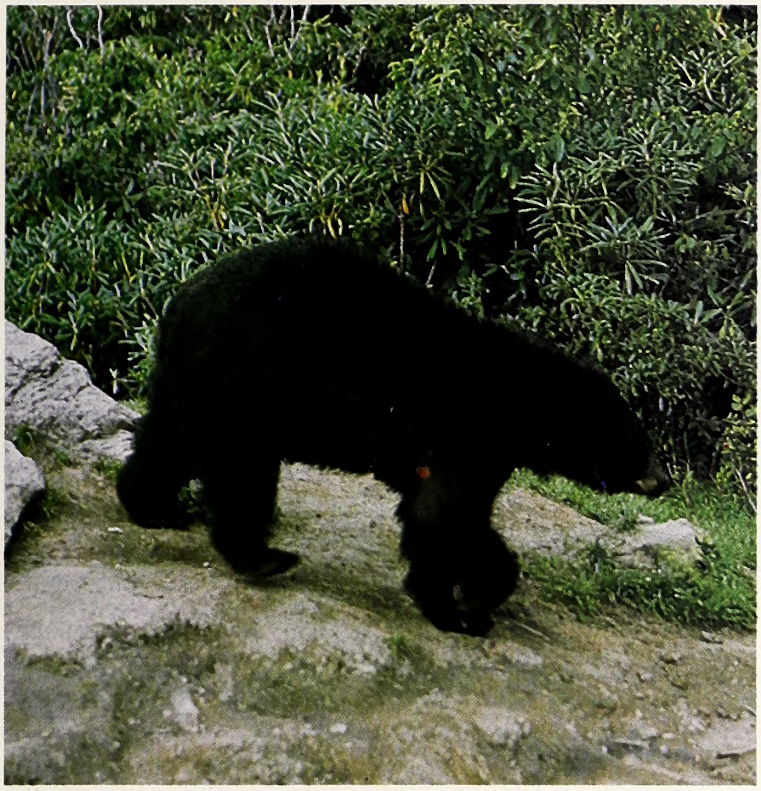
County	Number Reported Killed
Bertie	5
Martin	5
Northampton	1
Onslow	21
Alamance	6
Anson	1
Caswell	51
Chatham	12
Guilford	2
Johnston	3
Montgomery	3
Moore	1
Orange	3
Person	16
Randolph	1
Richmond	3
Burke	1
Cherokee	2
Mitchell	1
Polk	1
Rutherford	1
Transylvania	1
Total	141*

**1975-76 turkey kill was 145*

State-wide Wild Boar Kill

County	Male	Female	Total
Montgomery	2	0	2
Cherokee	1	1	2
Clay	1	0	1
Graham	6	3	9
Swain	1	0	1
Macon	3	2	5
Bladen	1	0	1
Total	15	6	21*

**Twelve of total were taken on Games Land.*



State-wide Bear Kills

County	Male	Female	Unknown	Total
Hyde	5	0	0	5
Beaufort	2	2	0	4
Duplin	1	2	0	3
Jones	3	2	0	5
Onslow	2	2	0	4
Pamlico	2	1	0	3
Pender	5	6	1	12
Bladen	5	4	0	9
Brunswick	5	0	0	5
Columbus	1	4	0	5
Wilkes	1	1	0	2
Avery	1	0	0	1
Burke	1	1	0	2
Caldwell	1	1	1	3
McDowell	3	1	0	4
Cherokee	2	1	0	3
Clay	1	0	0	1
Graham	3	2	0	5
Haywood	4	2	0	6
Macon	1	0	0	1
Madison	3	2	0	5
County not listed	1	0	0	1
Total	53	34	2	89

Reported North Carolina Deer Harvest 1976-77 Season

	DEER				MANNER OF TAKING					LANDS		
	Male	Female	Unknown	Total	Shotgun	Rifle	Muzzle Loader	Bow	Unknown	Game	Other	Unknown
DISTRICT 1												
Bertie	757	134	6	897	755	124	3	3	12	78	798	21
Camden	85	33		118	78	39		1		6	112	
Chowan	210	36	1	247	91	150		3	3	9	229	9
Currituck	81	4		85	30	55		1		1	82	2
Dare	92		1	93	47	45		3		80	11	2
Gates	671	189	3	863	743	106		3	11	50	776	37
Hertford	309	45		354	312	38	1		3	4	329	21
Hyde	637	407	5	1,049	432	525	4	72	16	189	821	39
Martin	457	61	2	520	342	166		3	9	16	478	26
Pasquotank	63	11	1	75	67	7		1		2	68	5
Perquimans	93	20	1	114	73	40			1	6	103	5
Tyrrell	90			90	37	51		2		53	34	3
Washington	97	34		131	54	55	1	20	1	13	115	3
TOTALS	3,642	974	20	4,636	3,061	1,401	9	109	56	507	3,956	173
DISTRICT 2												
Beaufort	895		5	900	96	795	3	2	4	100	777	23
Carteret	202			202	113	75	9	5		40	161	1
Craven	886	69	4	959	251	688	1	11	8	115	827	17
Duplin	211		2	213	119	91			3		205	8
Greene	6			6	2	4					6	
Jones	534	2	4	540	139	392	1	4	4	56	449	35
Lenoir	60			60	19	41					56	4
New Hanover	31			31	24	7					30	1
Onslow	752	123	4	879	750	103		22	4	26	841	12
Pamlico	445	72	3	520	51	453	2	5	9		496	24
Pender	1,096	1	11	1,108	584	504	1	3	16	31	1,019	58
Pitt	272		3	275	52	211	4	1	7		267	8
TOTALS	5,390	267	36	5,693	2,200	3,364	21	53	55	368	5,134	191

Deer Harvest continued

PHOTO BY DAVID R. STULTZ

	DEER				MANNER OF TAKING					LANDS		
	Male	Female	Unknown	Total	Shotgun	Rifle	Muzzle Loader	Bow	Unknown	Game	Other	Unknown
DISTRICT 3												
Edgecombe	673	212	3	888	488	385	2	8	5	5	857	26
Franklin	206			206	173	33				2	202	2
Halifax	1,022	346	4	1,372	664	652	15	30	11	93	1,231	48
Johnston	68			68	37	30		1			68	
Nash	169			169	76	92			1	1	167	1
Northampton	836	253		1,089	728	345	1	4	11	30	1,031	28
Vance	126			126	86	40				2	119	5
Wake	19			19	8	10			1		19	
Warren	391	1	3	395	354	36		1	4	34	356	5
TOTALS	3,510	812	10	4,332	2,614	1,623	18	44	33	167	4,050	115
DISTRICT 4												
Bladen	1,047	2	4	1,053	785	256	1	5	6	73	942	38
Brunswick	527		6	533	480	45		1	7	19	481	33
Columbus	627		1	628	555	62		4	7	35	557	36
Cumberland	118			118	55	57		1	5	2	115	1
Harnett	9			9	4	5					9	
Hoke	44			44	43				1	2	42	
Robeson	99			99	89	10				1	75	23
Sampson	358		1	359	227	129			3	2	332	25
Scotland	199	8	1	208	176	18		12	2	105	101	2
TOTALS	3,028	10	13	3,051	2,414	582	1	23	31	239	2,654	158
DISTRICT 5												
Alamance	52			52	40	11		1			50	2
Caswell	240			240	156	78	1	4	1	35	204	1
Chatham	33			33	31		2				32	1
Durham	94		1	95	53	35	4	2	1	20	71	4
Granville	345	17		362	171	138	8	44	1	90	266	6
Guilford	17			17	2	14		1			17	
Lee	1			1	1					1		
Orange	102		1	103	55	46	1	1			101	2
Person	168		2	170	120	46	1	1	2	3	163	4
Randolph	79			79	12	60	4	3		2	75	2
Rockingham	37			37	13	23		1			37	
TOTALS	1,168	17	4	1,189	654	451	21	58	5	151	1,016	22

	DEER				MANNER OF TAKING					LANDS		
	Male	Female	Unknown	Total	Shotgun	Rifle	Muzzle Loader	Bow	Unknown	Game	Other	Unknown
DISTRICT 6												
Anson	108			108	40	66		1	1	1	102	5
Davidson	159	4	2	165	22	122	14	7		13	150	2
Mecklenburg	1			1		1					1	
Montgomery	446	16	4	466	88	300	25	45	8	134	326	6
Moore	77			77	64	12	1			5	72	
Richmond	208	4	2	214	161	46		6	1	52	157	5
Rowan	161			161	23	111	17	10			161	
Stanly	80		1	81	15	50	13	3		2	76	3
TOTALS	1,240	24	9	1,273	413	708	70	72	10	207	1,045	21
DISTRICT 7												
Alexander	6			6	2	3	1				6	
Alleghany	237			237	5	202	25	4	1	3	228	6
Ashe	136	2		138		96	34	6	2	4	132	2
Davie	33			33	8	23	1	1			33	
Forsyth	5			5	1	4					5	
Iredell	48			48	7	37	1	1	2		46	2
Stokes	35	1	2	38	6	29	1	2		3	35	
Surry	120		2	122	9	98	9	5	1		118	4
Watauga	8	2		10		7	1	2		2	8	
Wilkes	260	12		272	9	207	22	33	1	72	199	1
Yadkin	59	1		60	5	51	2	2		5	55	
TOTALS	947	18	4	969	52	757	97	56	7	89	865	15
DISTRICT 8												
Avery	32	2		34	2	27	1	4		34		
Burke	273	8		281	14	239	8	18	2	136	145	
Caldwell	139	8	2	149	3	124	8	13	1	86	62	1
Cleveland	26			26	2	24					26	
McDowell	122	5		127	7	113		7		105	22	
Mitchell	13	1		14	1	10	1	2		10	4	
Rutherford	67			67	5	59	3			4	63	
Yancey	143	19	1	163	3	118	6	36		109	54	
TOTALS	815	43	3	861	37	714	27	80	3	484	376	1
DISTRICT 9												
Buncombe	87	50		137	2	132		1	2	14	118	5
Cherokee	9			9	2	7				9		
Clay	40	2		42		37	3	2		36	6	
Graham	15			15		15				10	5	
Haywood	94	7		101	1	83	2	15		100	1	
Henderson	85	4		89	3	80		6		47	42	
Jackson	2			2	1	1				1	1	
Macon	68	4	1	73	4	62		7		69	4	
Madison	25			25	1	24				22	3	
Polk	14	1		15	1	13		1		7	8	
Swain	7			7	2	4			1	2	5	
Transylvania	94		1	95	6	82	2	1	4	84	7	4
TOTALS	540	68	2	610	23	540	7	33	7	401	200	9
NO COUNTY LISTED	545	21	4	570	193	344	4	11	18	93	442	35
STATE TOTALS	20,825	2,254	105	23,184	11,661	10,484	275	539	225	2,706	19,738	740
PERCENT	90	10	—	100	50.3	45.2	1.2	2.3	—	11.7	85.1	3.2

PERCENT OF DEER HARVESTED ON GAME LANDS

District 1	District 2	District 3	District 4	District 5	District 6	District 7	District 8	District 9
10.9	6.5	3.9	7.8	12.7	16.3	9.2	56.2	65.7

WINTER BIRDS

by Michael Godfrey

Presented here are excerpts from a recently published book, "Winter Birds of the Carolinas and Nearby States" by Chapel Hill author-naturalist Mike Godfrey. The 136-page volume, fully illustrated with Mike's fine color photographs, is available from the publisher John F. Blair, 1406 Plaza Drive, Winston-Salem, N.C. 27103. The cost is $24.95, plus 52 cents shipping charges. N.C. residents add 3 percent sales tax.

RED-BELLIED WOODPECKER
Centurus carolinus

FIELD MARKS: Thin black and white stripes alternate across the back. White wing patches show in flight. The underparts are a dull white *occasionally* showing a faint rusty tinge. The back of the female's neck and head is red. The same marking on the male extends upward across the top of the head to the base of the bill.
LENGTH: 8½ inches.
VOICE: A loud CHAK; an ascending urgent YINK, YINK, YINK, YINK; a guttural WUCKA, WUCKA, WUCKA.
RANGE IN OUR REGION: Nests and winters throughout.
HABITAT: Woodlands of all types, from the cabbage palms of the barrier islands to the spruces of Mt. Mitchell.

"Showy," "noisy," "common," "conspicuous" are terms frequently applied to the red-bellied, our best-known medium-sized woodpecker. Common names more descriptive than red-bellied include "wood guinea" and "zebra woodpecker." The Latin name *Centurus carolinus* suggests the bird's association with the southeastern United States, although its range extends to the Mississippi and to the Great Lakes. Because it is numerous, loud and obvious, the red-bellied is often said not to be shy. However, while attempting close-up photography, I have found it excruciatingly skittish, backing hesitantly down a tree trunk toward suet, protesting loudly and tolerating *no* movement on the part of the photographer.

The flight is very strong, direct and deeply undulating. Excess airspeed is usually bled off with a steep upward swoop, at the top of which the bird alights on the trunk of a tree, never perching on a branch. The species is weakly migratory, its seasonal movements better described as wanderings.

The red-bellied is more vegetarian than most woodpeckers. Its diet is animal and vegetable matter in roughly equal quantities. It sometimes feeds on the ground, probing the forest litter for ants and grubs, but the bird is more at home hammering dead snags for wood-boring insects. In winter the wood guinea enjoys the

berries of holly, dogwood, Virginia creeper, honeysuckle and other persistent fruits. It warily but frequently accepts suet and sunflower seeds. In Florida the red-bellied often shows an unwelcome interest in ripening oranges. Hedging against hard times, it stores acorns and nuts for future use. It has been known to wedge large collections of insects into crevices in bark when more insects were available than could be eaten at a sitting.

The red-bellied shows red much more conspicuously on the head than on the belly. In fact, the name can be misleading, for the belly, under normal conditions of lighting and plumage, appears a dull white. I have one slightly underexposed photograph in which a faint reddish blush is visible, but under direct observation in bright sunlight the red on the underparts is not a reliable field mark. It is a common error to see the blazing red stripe that covers the back of the head and declare the bird a red-headed woodpecker. One comparative look at the two birds will clarify the point.

RED-HEADED WOODPECKER
Melanerpes erythrocephalus

FIELD MARKS: Strongly contrasting blocks of black and white show in flight. The entire head from the shoulders upward is blood red. At rest, the clean white on the underparts and on the secondary flight feathers is set against the glossy black back and shoulders, suggesting formal attire. The sexes are indistinguishable.
LENGTH: 7½ inches.
VOICE: A polyglot of calls including a loud KWEE-OH resembling the call of the crested flycatcher. And, as an old field guide describes the vocalizations, "something like the *wicker* of the flicker but gobbled and garbled on its way out; and sundry cacklings, chatterings, chirpings, and squawkings, all more or less raucous."
RANGE IN OUR REGION: Winters and nests throughout. Migrates irregularly depending on food supply.
HABITAT: Open mature deciduous woods. Often seen on older trees in towns.

The red-headed is our most colorful woodpecker. The scarlet head above black and white body parts is diagnostic. More white shows in flight that at rest, the trailing edges of the wings and the upper rump presenting a snowy mark by which the eye can follow the swift, undulating flight. The male of every other woodpecker in the eastern United States has red somewhere on the head, but only the red-headed has an *entirely* red head. Several woodpeckers, especially the red-bellied, are mistaken for the red-headed, but once seen, the red-headed is unforgettable. Through their first winter, the young retain an ash brown plumage with mottled white on the lower back. The plumage of the male and female adults is identical, but the plumage of the young is so markedly different from that of the adults that colonists believed them distinct species.

Audubon described the red-headed's demeanor as "gay, frolicsome." The modern observer, seeing the bird adapt to urban life in established neighborhoods shaded by mature hardwoods, might describe the behavior as calm and urbane. A capable carpenter, the red-headed is partial to creosote-treated utility poles. It sometimes riddles the hardened poles with nesting and roosting cavities as well as numerous lesser sculptures, seemingly made in contempt of human technology rather than in search of insects.

The diet includes a wide variety of plant and animal material. Beetles and their larvae, drilled from decaying wood, comprise the main insect portion. The red-headed can also be seen catching insects on the wing. I watched one leave an idle perch in a maple and, with an audible snap, catch a lacewing in flight 150 feet away over the parking lot of the Carolina Inn in Chapel Hill. It returned to the same perch, stuffed the insect into a crack, and began to preen. A single adult has been known to feed over six hundred insects to its young in an hour.

The vegetable portion of the red-headed's diet features fruits and nuts. In the early 1800's an observer described the red-headed woodpecker's fondness for cherries with this grim

calculation: "I may safely assert that a hundred have been shot upon a single cherry tree in one day." That observer was John James Audubon. If the principal bird lover of the time could watch or participate in such a persecution, we must be thankful that any of our wildlife survived the era.

There is a predatory side to the red-headed's personality. Audubon accused it of sucking the eggs of small birds and killing the young. An 1893 report from Ohio described a single red-headed wiping out a colony of cliff swallows nesting on a barn. The woodpecker broke the clay nests and ate the eggs and young. More recently, one was seen attacking a mouse in a city street. Perhaps we can hope that in the parts of our towns where old shade trees afford this handsome bird its necessary habitat, it might turn its predatory attentions toward the alien starlings and English sparrows as well as the mice.

GREAT HORNED OWL
Bubo virginianus

FIELD MARKS: A massive, blunt-headed bird with prominent ear tufts, yellow eyes and a whitish bib. The upperparts are mottled grays and browns, the underparts lighter and finely barred. A facial disc is evident. The sexes are indistinguishable.
LENGTH: 20 inches.
WINGSPAN: 55 inches.
VOICE: Male, a quick cadence of five or six hoots; female, seven or eight hoots of lower pitch.
RANGE IN OUR REGION: Winters and nests throughout.
HABITAT: All wooded habitats from coastal maritime shrub to highest mountains.

This is our largest owl and, next to the eagles, the mightiest bird of prey in the western hemisphere. If any raptor could justifiably be called dangerous, it would be the great horned owl, for no animal, man included, is immune to this fierce bird's attack. Assaults on humans are rare and are generally prompted by defense of the nest or are directed in error at a fur hat, but the effects can be injurious. A strike to the unprotected head of someone climbing a tree to a nest can cause a serious fall.

The immense natural range of the horned owl suggests something of its adaptability. It is found throughout the Americas wherever trees grow, from stunted willows of the arctic tundra to the equatorial rain forests and southward to the wind-tortured trees of Tierra del Fuego. Within this range the horned owl hunts in nearly every habitat, including suburban and even urban areas. Its populations appear to be at a maximum in most regions, despite drastic alterations to its habitats and direct persecution by man.

Wherever it lives, the horned owl takes the most readily available prey. Mammal fare ranges from mice and voles to stray cats, small dogs and full-grown foxes. Skunks are regular prey, and even porcupines are sometimes taken, though such an encounter can be fatal to the owl. Among a group of pellets I once collected was one containing the remains of a starnosed mole, the first reported as prey of a horned owl. Reptiles, amphibians and even fish are in the diet of the great raptor. A careful analysis of pellets collected by Drs. Frank and John Craighead in their Michigan study area showed

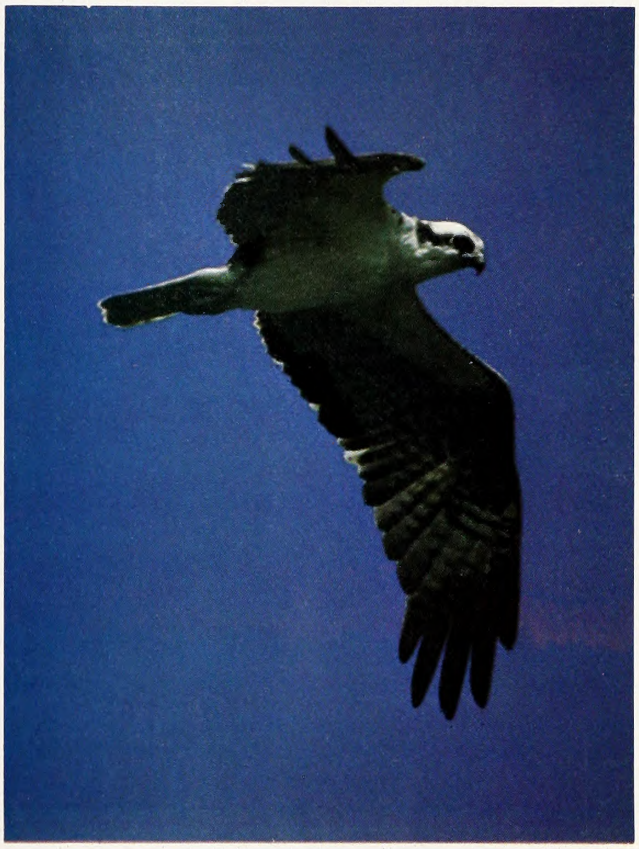
that rats and mice comprise over 90 percent of the winter food of horned owls.

I have found evidence that birds are favored as food for the young. At the base of a tree with a nest that I observed in Maryland in 1970, the remains of prey, presumably eaten by the young, contained a much higher proportion of bird bones and feathers than did the pellets of the adults. In Chapel Hill, North Carolina, in 1975, I discovered a nest in a wooded park and found the ground for yards around the nest littered with pigeon feathers. The owls lived in the woods but apparently roamed the town at night, nabbing pigeons from their roosts on University buildings and church steeples. One pellet recovered a few yards from the nest contained the entire leg and talon of a barred owl. The foot had not been subjected to the digestive juices of the horned owl's stomach, so I am left to assume that the bird went about for some time with the smaller owl's foot sticking out of its mouth.

The horned owl's annual cycle is shifted a full season ahead of the schedule of most other birdlife. In midwinter the territorial vocalizations of mated pairs boom across the icy nights. Until recently I lived at the edge of a large wooded tract near Chapel Hill and at times heard as many as three pairs of horned owls defining their boundaries. One pair often called from a tree over my roof in a fuguelike cadence in which the female boomed in with her lower-voiced sequence at the male's third note.

By Christmas, in the Carolinas, the territories are established and nesting activities begin. The nest is often a remodeled hawk or squirrel dwelling 30 feet or higher in a tree. Both adults share incubation duties, and the young hatch in mid-February. The owlets wear white down for their first fortnight, then grow a brownish coat of down-tipped contour feathers. They eat voraciously while growing. The availability of bird prey on exposed roosting perches before the leaves erupt may be one incentive for early nesting. The fact that the young owls need several months of parental subsidy after fledging in April contributes to the requirement for their early start. Most birds do not begin to nest until after the foilage deploys. Throughout the summer and into autumn the adults feed the young as they learn to hunt for their own prey.

The horned owl is wary but quite comfortable near civilization. Its boldness and its capability as a predator, sometimes of songbirds and small game, led some to consider *virginianus* a "bad" owl. It was not until recently that North Carolina, for example, accorded the horned owl and the Cooper's hawk, another "bad" raptor, the full protection of law. This trend in protection recognizes the new understanding that "good" and "bad" have no meaning in nature, and at best reflect only man's perceived economic interests. The great horned owl is a legitimate predator entitled to its prey no less than the human hunter. It is a necessary controller of rodents in the woods and fields and a benefactor to game, weeding out the sick and inept.



OSPREY
Pandion haliaetus

FIELD MARKS: The wings are crooked in flight. Markings feature white underparts and head, black mask and blackish upperparts. There is streaking on the crown of the slightly larger female.
LENGTH: 22 inches.
WINGSPAN: 5 to 6 feet.
VOICE: High, piping PEEPs.
RANGE IN OUR REGION: Winters occasionally along the Georgia and South Carolina coasts, marshes and sounds. Ventures inland in late winter and early spring as northward migration begins.
HABITAT: Near water. Inland, it favors large farm ponds and rivers. Greatest concentrations are in coastal marshes and sounds.

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Part II

SOME NORTH CAROLINA

DECOYS AND THEIR MAKERS

BY JAMES S. LEWIS, JR.

When I moved southward from Knotts Island, searching for what proved to be extremely elusive information about our early decoy carvers, I was directed to Blanton Saunders of Poplar Branch, who told me that he started carving decoys after 1935, when live decoys were outlawed. Until they became illegal, the Saunders kept Canada geese, snow geese and mallards, which drew the wild flocks to the hunters as no counterfeit waterfowl have ever done since. Blanton's father, Ellie W. Saunders, and his grandfather, Daniel W. Saunders, were not only market hunters themselves but made decoys and boats to sell to other hunters.

When Blanton started making decoys, they obtained the juniper (white cedar) by wading into the swamps with cross-cut saws and axes over their shoulders. They felled the trees and sawed the logs into short sections which they then split, with wedges and axes, into blocks of a suitable size for making decoy bodies. The blocks were packed out of the swamp on their backs and seasoned before being chopped and whittled into decoys. Who says, those were the good old days? Many sailing vessels were wrecked and pounded to pieces along the Outer Banks and the masts and spars that washed ashore frequently served as a source of wood for decoys.

The canvasback drake shown in Fig. 7 was made by Bob Moss. The redhead drake on the left in this photograph was made by Pat O'Neal and the redhead on the right was made by the Saunders family. Moss and O'Neal made large battery decoys as well as small boats, and lived on Church's Island.

Besides carved wooden battery decoys, Pat O'Neal made canvas-covered slat goose decoys. In addition to decoys and skiffs, this man of wide interests and many skills, produced powered cruisers at his boat works and operated a railway from Coinjock.

All of these men were working early in this century, and during the same period, Callie O'Neal, a guide who made decoys for his own use only, was operating a battery rig from Church's Island. A pair of his canvasbacks are shown in Fig. 8. Beside them is a canvasback drake attributed to the Douglas family, about whom little could be learned except that they made decoys and hunted in the northern reaches of Currituck Sound.

We have already mentioned the individual

. 7. Top: Canvasback drake by Bob Moss. tom from left: Redhead drake by Pat O'Neal l Redhead drake by the Saunders family.

Fig. 11. Two Redhead drakes by the Roberts Brothers.

Fig. 15. Pair of wire frame, canvas-covered Mallards, and hand-carved Bluebill by Mannie Haywood. Note vertical joint through head of Mallard drake.

g. 8. Top and lower left: Pair of Canvasbacks Callie O'Neal. Canvasback drake by the ouglas family.

Fig. 12. Two Bluebill drakes by the Tillets. Bottom decoy has roothead.

Fig. 16. Wire frame, canvas-covered Goose by J. H. Hayman and pair of Mallards by Marvin Midgett (note that vertical joint in duck heads is invisible).

. 9. Pair of Canvasbacks and a Ruddy by Alvirah Wright. rake and Ruddy from collection of Tilford Wade).

Fig. 13. Group of battery decoys typical of Currituck Sound, by unknown makers. (Ruddy from collection of Tilford Wade).

. 10. Exceptionally fine Ruddy with nging cast-iron keel weight by irah Wright (from collection of Til- l Wade).

Fig. 14. Very large Swan from Knotts Island, maker unknown.

Fig. 17. Roothead Brant and Canada Goose (repaint) attributed to Frank Gaskill.

Fig. 18. Roothead Canada Goose (old repaint) and roothead Brant attributed to Gary Bragg.

style of Alvirah Wright, who worked in the vicinity of Point Harbor, and a pair of his large, high-head canvasbacks, accompanied by one of his eye-catching ruddies, are shown in Fig. 9. His other ruddy, with swinging cast-iron weight attached, was such an exceptional example of style, coupled with skilled, innovative workmanship, that it is shown separately in Fig. 10.

The two redhead drakes shown in Fig. 11 are attributed to the Roberts brothers from the Currituck Sound area. Nothing could be learned about them.

The two bluebills in Fig. 12 were used, and possibly made, by Allen and Alphonso Tillett of Kitty Hawk. Both were hunters and Allen is known to have made some shorebirds. Possibly more could be learned about them.

Besides the early decoy carvers whose work may be identified by their individual styles, or sometimes by their initials, there were many waterfowl hunters who made decoys for their own use only, and the origins of these decoys will never be known. The battery decoys of the Currituck area are characterized chiefly by their large size and simple ruggedness, and it is true that many could be termed crude. Fig. 13 shows a group of decoys which are typical of this area, but whose makers are unknown. They show evidence of much use, and many repaints obviously not splashed on by artists, and they are characteristic of the blocks which still may be turned up in that area by collectors who persevere — and are lucky.

Fig. 14 is a swan from Knotts Island, maker unknown, whose large size and double-curved neck would cause it to attract attention in any rig. Decoys in the form of swans, gulls and herons were placed with other waterfowl decoys in order to gain the confidence of desirable species, which were so wary as to be difficult to attract to ordinary decoys of their own kind. When so used, they were called "confidence decoys". In earlier days, when it was legal, swans also were hunted as game for the market or for the pot.

Moving a short distance south from Currituck, we come to Collington, the home of Mannie Haywood who carved some decoys from solid wood, but is much better known for his canvas-covered wire frames mounted on pine plank bottoms. Some of his decoys may be identified by his initials MH cut into the plank bottom. Besides having a very creditable paint job, his decoys frequently displayed an interesting innovation in the construction of the heads. To overcome the common weakness which caused almost all decoys to crack through the neck, with the grain of the wood, when subjected to the alternate wetting and drying accompanying use, Haywood placed a vertical joint through the head, just behind the eyes.

This joint allowed the grain of the wood comprising the neck and rear portion of the head to run vertically, while the grain of the wood in the forepart of the head and the bill ran horizontally, or at right angles to the neck, thus eliminating the planes of weakness in the neck, through which cracks occurred. The joint

Fig. 19. Rootheads typical of the Ocracoke - Portsmouth Island area, which probably have served as both Brant and Geese, as the need of the painter might determine.

through the head of the mallard drake in Fig. 15, which is made in this manner, shows quite clearly. The solid wood bluebill in this picture was attributed to Haywood. The pair of canvas-covered mallard decoys in Fig. 16 was made by Marvin Midgett of Kitty Hawk, who also used a vertical joint to improve the strength of the heads. The heads he made are of superior form and construction, with the vertical joints so tightly fitted as to be almost invisible. The canvas-covered goose in this group was made by J. H. Hayman of Coinjock. Because of their comparative lightness, canvas-covered duck, goose and swan decoys were often used in this area.

For most of the information about the early decoy carvers who worked around Back Bay and Currituck Sound, I am indebted to Tilford Wade, a decoy collector and duck hunter of Knotts Island, who spent many hours digging out facts and human interest stories which could not have been brought to light without his help. Without his aid, this story could not have

Fig. 20. Four by Mitchel Fulcher. Top from left: Brant and Blackduck (from collection of Roy Willis). Bottom from left: Pintail drake (from collection of Roy Willis) and Bluebill drake. The Pintail drake was made by Fulcher for Roy's grandfather.

been written. Decoys loaned from his collection by Mr. Wade for use in illustrating this article included the ruddy ducks shown in Figures 3 and 5 (Part 1), Figures 9, 10 and 13, and the canvasback in Figure 9. Roy Bull, a former duck hunter (now decoy collector) of Townsend, Va. also helped by sharing his knowledge of North Carolina decoys.

Some other decoy carvers who are known to have worked on and in the vicinity of Currituck Sound, but who have not been mentioned because their work could not be illustrated, were J. Adams, Solomon Beasley, Roy Dudley, A. Grady, John Lewark, H. F. Stone, Wilton Walker and David Witson. This list could be made much longer.

As we move south of Kill Devil Hills, along the Outer Banks, we reach territory where waterfowl, and decoys to attract them to the hunter's blinds, have abounded for a long period, but very little information about the decoy carvers is to be had. It is said that Frank Gaskill of Portsmouth Island made roothead brant and geese, and Fig. 17 shows a brant and a repainted goose which are attributed to him. Gary Bragg is said to have made roothead decoys in the vicinity of Ocracoke, and the almost paintless roothead brant and goose shown in Fig. 18, both of which were found near Ocracoke, probably are typical of the work he did.

By using rootheads, a device to which some early carvers of Long Island also had resorted, these men overcame the same difficulty that Mannie Haywood and Marvin Midgett had mastered by putting a vertical joint in the heads of their canvas-covered decoys. The choice and shaping of these roots, or knots, required a positive talent which added interest and charm to the decoy. Considering the amount of waterfowl hunting that was done on the Outer Banks, and the great quantities of decoys which were made locally, it is surprising that we are left with so little knowledge of the carvers and so few of their decoys of identifiable origin.

Perhaps there are sources of information which have not been located, and are yet available for discovery, by an enterprising searcher who thoroughly probes that stretch of clean ocean beaches and grass covered marshes between Oregon Inlet and Swash Inlet. The two decoys shown in Fig. 19 probably at various times have served as both brant and geese, depending on the immediate need of the painter, and both are typical of the rootheads made in the Ocracoke-Portsmouth Island area.

A short distance south of Portsmouth Island, we come to an area (Core Sound) which stretches roughly from Cedar Island to Harker's Island, in which the decoy carvers and their products are better known. In this area, both the Fulcher and the Willis families contained several members who are well known for the decoys they made during a period beginning well before the turn of the century. Mitchel Fulcher (1869 - 1950) of Stacy probably is better known for the artistic merit, as well as the variety and quality of his work, than is any other carver from this area.

He made decoys for both diving ducks and marsh ducks, as well as for geese, and Fig. 20 shows the smooth graceful lines of his carving. His painting is shown at its best on his pintail drakes, one of which is shown in this picture. On other work of his observed by the writer, his painting was creditable, but hardly outstanding. The backs of his bluebills were characterized by an interesting dappled effect and his son, Cartey Fulcher of Stacy, says that he obtained this with a snuff brush. For the enlightenment of any reader who may be insufficiently informed about the old, but not extinct, custom of dipping snuff, a snuff brush was made by jerking a small twig from a blackgum tree in such manner as to pull the knot out of the limb with the twig.

This exceptionally tough knot was then peeled and chewed (by one of the youngsters, if for grandma's use) until its fibers were crushed to form a small brush. The moistened brush was then used to dip snuff from a can and transfer it for snug deposit between the lower lip and gum. There it might be packed to give pleasure and serve as a stimulus for a period, without showing any (well, hardly any) evidence of its use. This is the type of brush that was used to create the effect which can be seen on the back of Fulcher's bluebill drake in Fig. 20. Cartey also said that his father, when making heads, used the open end of a .22 cartridge case to stamp circles in which the eyes later would be painted. Besides making decoys for sale to other hunters and clubs, Fulcher served as guide and caretaker at the Green Island Club for many years.

Natural Landmark State Parks

by Marcia Constantino

• Animal or plant life from an earlier time, outstanding geological formations, and habitats supporting vanishing, rare, or restricted species are among the values looked at by the National Park Service in selecting areas as National Natural Landmarks.

Six North Carolina State Parks include registered Natural Landmarks. They are Mount Mitchell on the Blue Ridge Parkway, Mount Jefferson near West Jefferson, Stone Mountain west of Roaring Gap, Pilot Mountain north of Winston-Salem, Piedmont Beech Natural Area in William B. Umstead near Raleigh, and Jockey's Ridge at Nags Head.

The Natural Landmark program is administered by the U.S. Department of the Interior through the National Park Service. The program seeks to encourage preservation of outstanding examples of the country's natural and historical resources for all Americans. The national policy of protecting significant publicly or privately owned properties began in 1864 when the Congress decreed that Yosemite Valley be protected as parkland by the State of California.

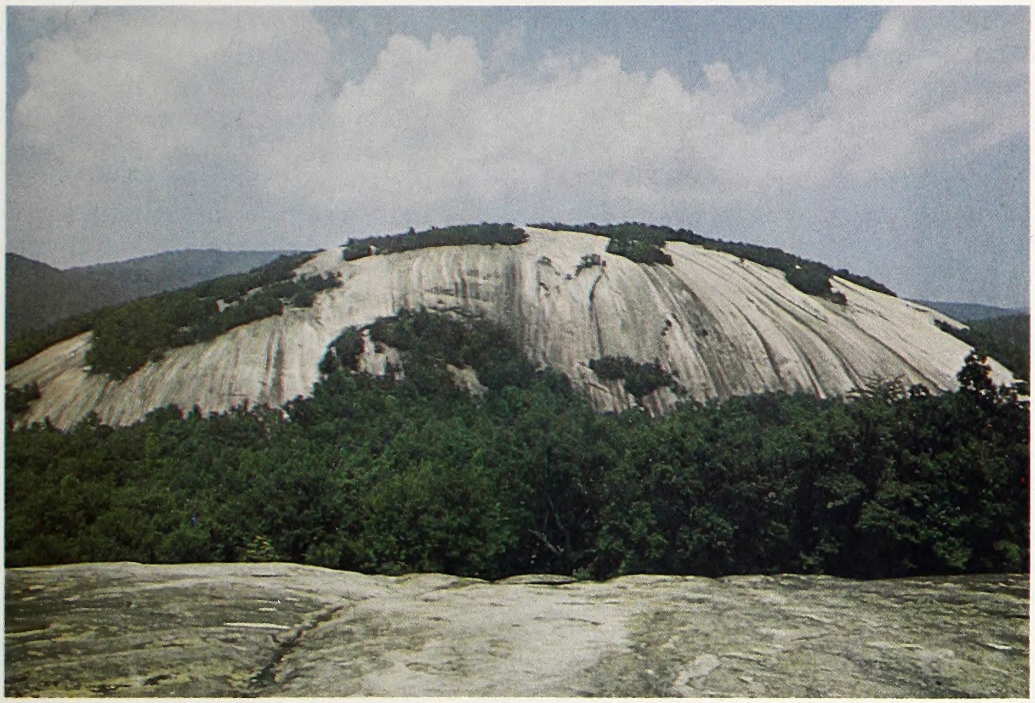
Once an area has been registered as a Natural Landmark, it is important that its integrity be maintained. The N.C. Division of Parks and Recreation is responsible for ensuring that the six state parks continue to preserve and protect those natural and scenic features which were selected as Natural Landmarks.

Mount Mitchell State Park

Mount Mitchell, at 6,684 feet above sea level, is the highest peak east of the Mississippi River. Capping the mountain is the most extensive stand of Fraser fir in the United States. This evergreen forest has survived since the last Ice Age, and associated with it is an interesting group of flora and fauna characteristic of Canadian forests far to the north. The existence of this remnant forest community in the southern Appalachians is due to the cool climatic conditions present at Mount Mitchell's high elevation.

PHOTO BY JIM PAGE

Mount Jefferson State Park (top) offers unusual panoramic views of North Carolina's northern mountains. A wide variety of forest trees are present. The Balsam Trail of Mount Mitchell identifies many of the plants of the area with labeled markers like the one shown above.



Rising 600 feet above its base, this massive granite monadnock forms the focal point of Stone Mountain State Park. Hiking trails are the only developed elements in the Park.

PHOTO BY JIM PAGE

Another geologic formation (below, left) rises 1,500 feet from the heart of Pilot Mountain State Park and can be seen for miles. A self-guiding nature trail and several other hiking trails are maintained in the Park. Near the other end of the State is the East Coast's tallest sand dune, Jockey's Ridge (below). This area is constantly changing but many dunes and forested areas are now stabilized.

PHOTO BY CLAY NOLEN

Descriptive markers along the Balsam Trail from the parking area to the summit of Mount Mitchell identify a variety of trees, shrubs, and woodland wildflowers. The Fraser fir, balsam fir, and red spruce are the most numerous trees in the park. Yellow birch, mountain ash, and the paper birch are other cool climate trees. Spring and summer wildflowers include wood sorrell, filmy angelica, bluets, and mountain aster. Common northern type animals include winter wrens, juncos, red squirrels, and the New England hare.

Park facilities for picnicking, limited tent camping, and nature interpretation reflect low intensity development to protect the natural integrity of the park.

In 1915 Mount Mitchell was established as the first state park in the system, a measure which halted extensive logging of the forested area. Although much of the surrounding forest was once ravaged by logging operations, the Fraser fir forest within the park has never been cut.

Mount Jefferson State Park

One of the finest remaining examples of oak-chestnut forest in the southeastern United States qualified 541-acre Mount Jefferson State Park as a Natural Landmark. The mountain rises to an elevation of 4,683 feet, towering some 1,600 feet higher than the surrounding countryside. The uppermost forest dominated by large northern red oaks is essentially virgin. The public should understand that the chestnuts are not mature, but are the occasionally fruiting sprouts of stumps killed by the blight.

Yellow birch and mountain ash are also represented in the higher elevations. Oaks, basswood, cucumber trees, magnolia, and maples prevail on

the lower elevations. Color displays of purple rhododendron, mountain laurel, and azalea add to the mountain's scenic beauty in late spring and early summer.

Activities in the park focus on scenic enjoyment, picnicking, hiking, and nature study. One trail guides hikers to a prominent overlook; another short trail leads to the lookout tower on the summit of the mountain.

Stone Mountain State Park

Stone Mountain is the best example of a monadnock in massive granite in North Carolina. The oval-shaped dome rises 600 feet above its base, which is three miles in circumference. The mountain was formed millions of years ago when molten rock intruded into older surrounding rocks. It has resisted the weathering that eroded the foothills around it.

The 345-acre landmark site within the 10,171-acre park includes all of the monadnock and a wooded buffer zone at its base. Much of the mountaintop is smooth surfaced and sloping. Lichens, mosses, and club mosses on the exposed surface are unique to granite outcrops. Red cedar and three species of pine are transitional species growing between the granite faces and the forest of mixed pine and hardwoods.

Despite logging activities on the mountain from 1936 to 1956 before the park was established, Stone Mountain remains one of the incredibly beautiful areas in the State. Except for designated hiking trails, the State does not plan to develop Stone Mountain itself. The trails would provide valuable opportunities for nature interpretation and ecological studies.

Bird life in the park is varied and includes grouse, pileated woodpecker, and scarlet tanager. A small herd of wild goats lives on and around the mountain.

Hiking, picnicking, and primitive camping are current visitor activities. The long range park master plan calls for development of recreational facilities for camping, boating, fishing, and picnicking southwest of Stone Mountain.

Pilot Mountain State Park

Pilot Mountain is a quartzite monadnock which rises 1,500 feet above the Piedmont Plateau. It is topped by two distinctive pinnacles. The knob of the Big Pinnacle juts skyward more than 200 feet from a symmetrical base and can be seen for miles. The Indians called the mountain Jomeoke, meaning "Great Guide" or "Pilot."

The landmark site within the park covers 700 acres surrounding the pinnacles. The vegetation of Pilot Mountain is closely related to that of the Appalachian Mountains although the site is actually in the Piedmont. Chestnut oak, table mountain pine, mountain laurel, and purple rhododendron are some of the typical mountain species found here. The mountain harbors the only permanent nesting ground for the raven in the Piedmont. These large and impressive black birds can often be spotted soaring about the Big Pinnacle.

Several hiking trails varying in length and difficulty originate near the Little Pinnacle and wind throughout the mountain section. The Sassafras Trail, a self-guiding nature study trail, has numbered posts keyed to a descriptive booklet.

Pilot Mountain State Park encompasses 3,740 acres in two separate sections joined by a five-mile long, 300-foot wide woodland hiking and horseback riding corridor. Recreational activities range from picnicking and camping in the Pilot Mountain section to primitive camping, picnicking, canoeing, and fishing in the Yadkin River section. Proposed long range development of additional recreational facilities will be located outside the landmark site.

William B. Umstead State Park—Piedmont Beech Natural Area

A 50-acre tract within 5,000-acre William B. Umstead State Park represents the finest example of mixed mesophytic forest in the eastern Piedmont of North Carolina. One of four ravines in the landmark site contains an almost pure stand of beech, possibly a virgin remnant over 200 years old.

Several mountain species of plants grow within the site including mountain laurel, galax, and purple rhododendron. Crabtree Creek, flowing through the natural area, is one of the last refuges of the beaver in this section of the State.

Students and educators from several universities in the area use the remote site for nature study and research. Group hikes to the Piedmont Beech Natural Area are conducted by park staff on request.

Jockey's Ridge and Nags Head Woods

At 140 feet in height, Jockey's Ridge is the tallest sand dune on the East Coast. A 1,980-acre tract including the giant dune and Nags Head Woods is registered as a Natural Landmark.

The site illustrates the range of dune development from shifting open dunes to forested stabilized dunes, an unusual phenomenon on the Atlantic

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NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Goose and Duck Hunters: CAUTION

December 7 (at noon) marks the beginning of the second segment of the duck and goose season in North Carolina. Word comes from Jerry Holloman, refuge manager of the Pee Dee National Wildlife Refuge, that the following area is closed to all migratory bird hunting: the Pee Dee River from the confluence of Pressley Creek to approximately 5 miles downstream to the confluence of Brown Creek and the Pee Dee River. Included also are the waters surrounding Buzzard Island and that part of the Pee Dee River on the northeast side of Leak Island beginning approximately one-fourth mile downstream from the head of Leak Island (at the head of a small unnamed island), and continuing downstream to the main channel of the Pee Dee River and containing, in all, 220 acres.

Right Gun, Wrong Ammunition

The Sporting Arms and Ammunition Manufacturers' Institute reminds all hunters that their sporting guns are built and designed for a particular cartridge and load. Although other ammunition may fit the chamber, it should not be used. Use only that ammunition recommended by the gun manufacturer.

Free Wildlife Planting Material

The Wildlife Resources Commission has free wildlife habitat plantings for distribution. Application forms for these are available from County SCS offices, County Extension offices, field biologists, wildlife enforcement officers or by writing Wildlife Plantings, Wildlife Commission, 512 N. Salisbury St., Archdale Building, Raleigh, N. C. 27611. Available are annual and permanent (perennial) seed mixtures and a limited supply of several other types of planting materials.

Christmas is Coming

Last-minute shoppers might want to consider a gift subscription to WILDLIFE IN NORTH CAROLINA (or several), or maybe a bird feeder, a bag of bird feed, or perhaps one of the many fine books on wildlife. These gifts keep on giving all year.

Aphrodite's Ghost

THE SWAN IN NORTH CAROLINA conclusion

by R. Wharton Gaul

PHOTO BY F. EUGENE HESTER

Future management plans for the whistling swan will continue to strive to ensure a healthy population of birds for all times.

• Because of the rapid increase in the numbers of swans, particularly in the Pacific flyway, a limited season was opened on them in Utah in 1962 and has continued up to the present time. It now also includes Nevada and Montana. The season is rigidly restricted, carefully monitored, and extremely limited. Although swans no longer apparently appear off the Texas coast, this is apparently due more to a change in migratory habits than it is to any diminution in numbers of continental birds.

Swans suffer from most of the usual conditions of waterfowl. Foxes and ravens take their toll on the breeding grounds, as well as those predators already mentioned. Natural hazards (Niagara Falls has been described as a trap for waterfowl) also take their toll. Fowl cholera, parasites, botulism, and many other diseases occasionally cut into the numbers. I am recently informed that up to a thousand swans per year have perished from lead poisoning in the Mattamuskeet area although with the closing of the refuge to hunting, this figure should decrease in time.

The problem faced by the whistling swan today, and in particular on his wintering habitat in North Carolina, is the same as that faced by most wildlife. Despite the increasing efforts of environmentalists, conservationists, sportsmen, and forward looking men in government, wildlife habitat is shrinking every year. At the same time, many protected species such as the whistling swan are increasing steadily. Their breeding grounds are mostly beyond the effects of civilization. As noted in the swan data tables accompanying the article, these numbers have increased steadily during the past seventeen years in North Carolina as well as in the Atlantic flyway. In addition, note the continued high proportion of the young in the last column. Their nestings have been fairly successful and there is no reason to think they will not continue to increase. Many of the predators such as the wolf, eagle, hawk, and similar predatory birds and animals have themselves suffered so terribly at the hands of civilization that they are no longer present in sufficient numbers to provide a check on unrestrained reproduction. The balance of nature has been upset. In the long run, this usually leads to disaster.

But this is only part of the picture. Equally important with their marked increase in numbers is the feeding habit of the whistling swan. Although they do migrate into fields, and under certain circumstances can wipe out a crop in a very short time, the primary damage that they do is the result of their tip-up feeding in shallow waters. When tearing vegetation off the bottom of the shallows, their feet frequently wash out large holes several feet in diameter. It takes a long time for vegetation to reseed itself in such places, and a few thousand swans can very rapidly denude a previously richly vegetated area. Again, nature is able to take this into account as long as natural checks and balances are in effect keeping populations under control.

Apparently it is this type of situation which led to the opening of a very limited, stringently controlled season on the wild swan in Utah. As noted earlier, this was first initiated in 1962. It is done under a special permit plan,

one thousand of these permits being issued yearly. From the data I have available to me, it would appear that relatively few swans are taken yearly. Whether this is enough to provide a natural check on the population overgrowth natural to all biological creatures, I cannot say. It has, however, provided some check on swan populations, and at the same time has provided funds for further biological research into waterfowl. The importance of this cannot be discounted.

In North Carolina a similar situation applies to the greater snow goose which winters on Currituck Sound, the Pea Island National Wildlife Refuge, and surroundings, and they have increased in such numbers that they were outgrowing their habitat and beginning to damage farmers' crops. The limited snow goose season, which has been in effect for several years, has apparently been of some benefit in controlling this population without damaging overall snow goose populations to any degree. Perhaps a similar situation applies to the whistling swan. It is at least worthy of intelligent consideration.

Consideration of an open season on the swan goes as far back as 1916 when it was not considered that such a season would do any harm. In fact, to quote Doctor Bent, "In Back Bay, Virginia, and in Currituck Sound, North Carolina, the swans feast on the roots of the wild celery and foxtail grass; they are now (1916) so numerous that they do considerable damage by treading great holes in the mud and by rooting and pulling up the celery and grass; they thus waste large quantities of these valuable duck foods, much more than they consume, and consequently spoil some of the best feeding grounds for ducks, much to the disgust of the sportsmen in the various clubs, who are not allowed to shoot the swans and have to submit to this interference with their duck shooting. The swans are really such a nuisance in this particular locality that a reasonable amount of shooting might well be allowed; these birds are so wary that there is little danger of any great number being killed."

What of the future of the whistling swan? It is not likely that its breeding grounds will ever be particularly popular as a place for human habitation. However, it is unfortunately true that there are oil and gas deposits in the far north which will lead to exploration and further destruction of habitat. Perhaps with increased knowledge and appreciation of the needs of living things we will begin to provide satisfactory protection for these creatures. Many of us thought that this was already the case with the creation of the Arctic National Wildlife Refuge. Now we understand plans are afoot to run a gas pipeline through the middle of this refuge. Thus, as it is in protecting the freedom of man, so it is in protecting the freedom of wildlife: eternal vigilance is necessary.

Historical Whistling Swan Data
North Carolina 1960-77

Year	At* Mattamuskeet	In** North Carolina	In** Atlantic FW	Percent in North Carolina**	Percent Young in FW
1960	4,000	12,800	41,100	31.1	NA
1961	930	16,800	62,500	26.9	15.0
1962	1,000	9,200	39,400	23.4	16.7
1963	1,950	13,000	61,400	21.2	14.8
1964	1,220	24,660	61,000	40.4	12.1
1965	530	7,880	54,000	14.6	12.1
1966	1,500	10,890	57,800	18.8	11.2
1967	3,200	18,820	72,300	26.0	9.0
1968	3,000	17,200	45,600	37.7	10.1
1969	5,650	25,600	62,000	41.3	4.8
1970	11,000	15,000	55,000	27.3	14.9
1971	9,000	16,000	58,200	27.5	14.6
1972	11,000	17,000	62,800	27.1	4.4
1973	11,700	19,000	57,100	33.3	14.6
1974	18,000	25,000	64,200	38.9	17.4
1975	20,160	26,900	66,900	40.2	18.5***
1976	22,900	41,700	78,650	53.0	13.6***
1977	NA	43,300	76,200	58.6	

* *overwintering peak (Sept. to Apr.)*
** *mid-winter estimate (Jan. 1-20) each year*
****Mattamuskeet only*

Prepared by: Otto Florschutz, Jr.
East Coast Biologist, U.S. Fish & Wildlife Service
Washington, North Carolina, February 24, 1977

I am grateful to:

Otto Florschutz, Jr., East Coast Biologist, Refuges and Wildlife Resources, Washington, North Carolina — for the Mattamuskeet Swan Data accompanying this article; Doctor Warren Blandin, Atlantic Flyway Representative, Office of Migratory Bird Management, U.S. Department of the Interior, Laurel, Maryland — for information on predation on the breeding grounds, hatching success, and information on the far western swan seasons; Doctor Milton Friend, National Fish & Wildlife Health Lab, Madison, Wisconsin — for information on diseases of swans; Doctor Malcolm E. McDonald, National Fish & Wildlife Health Lab, Madison, Wisconsin — for information on parasites in swans.

STEM TO STERN

by Ed Jenkins

With so many written and visual messages thrown at us in magazines and on television and radio these days, there's no wonder we almost instinctively screen out information we feel is not worth our attention. You're probably wondering right now if this article will be worth your time to read.

I'm going to make the decision easy for you. Just three questions — get 'em all right, and you can pass over the rest of the article with a clear conscience. Miss one or more, and you'd better read on.

1. One half of all boating fatalities occur during the colder months (September-May) of the year.

   true false

2. An alcoholic beverage is helpful in rewarming a person who is suffering from exposure to extremely cold weather such as a fall overboard in the winter.

   true false

3. Victim A, a child, is recovered from being under water for 10 minutes *during the summer*. All symptoms of death are present. Victim B, same age, is recovered *during the winter* after being under water for the same amount of time. All symptoms of death are present.

   Who has the best chance of survival and recovery without brain damage?

   Victim A Victim B both have the same chance

Answers: (#1 - true, #2 - false, #3 Victim B)

Well, how'd you do? I guess if you're reading this though, you probably missed one or more. Don't feel bad if that's the case, we didn't try to make them easy. And many of the facts concerning drownings, especially in cold water, are relatively new and may contradict things we have been told in the past.

Let's review the questions. The answer to question #1 is *true*. Approximately one half of all boating fatalities occur during the colder months of the year.

Although there are more cold weather months than warm ones, most people spend the greatest amount of time on the water during the summer. Since boating activity is drastically reduced when temperatures drop and becomes almost nonexistent during the harsher times, why are there so many fatalities?

The answer, obviously, is the cold weather factor. Survival time in cold water is drastically reduced (see chart). Also, since fewer people are on the water, the chance of rescue or assistance from other boats is usually longer in arriving thus increasing one's exposure to the cold.

Water Temperature (°F)	Exhaustion or Unconsciousness	Expected Survival Time
32.5	Under 15 minutes	Under 15-45 minutes
32.5 - 40	15-30 minutes	30-90 minutes
40 - 50	30-60 minutes	1-3 hours
50 - 60	1-2 hours	1-6 hours
60 - 70	2-7 hours	2-40 hours
70 - 80	3-12 hours	3-indefinite
Over 80	Indefinite	Indefinite

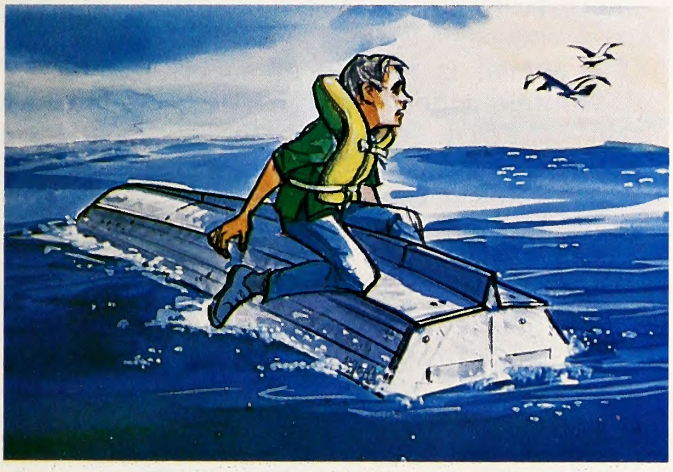
Survival in cold water depends on many factors. The temperature of the water is only one. Others include body size, fat, physical condition, and activity in the water to name a few. Large people have more insulation and are more buoyant, thus they do not expend as much energy nor cool as fast as thin people. Swimming and treading water increases the cooling rate by about 35 percent. So it is best to stay still and conserve heat if possible.

By assuming a fetal (heat escape lessening posture, H.E.L.P.) posture one can increase his survival time in the water by protecting the high heat transfer areas of his body. In the H.E.L.P. position, the arms are held tight against the sides of the chest where there is little insulating muscle or fat. The thighs are raised to minimize heat loss from the groin area where large blood and lymph vessels lie near the surface.

When three or more people are in the water, they should huddle facing each other so that the sides of their chests are held close together. This can also increase survival time.

The key to survival in cold water is a personal flotation device (PFD). A PFD will support a person allowing him to remain afloat without treading water and thus conserving energy and reducing heat loss. A PFD can also keep a person's face out of the water preventing drowning should the victim lose consciousness.

The potential for a serious accident is greatly increased during the winter. Avoiding such problems should be the prime concern.



In case of an accident, stay with the boat. To conserve heat, keep as much of your body as possible out of the water (above). If you have to remain in the water, assume the "fetal" or Heat Escape Lessening Posture (HELP). In 50°F water, this position can double your expected survival time.

The treatment for a cold water dunking and mild case of hypothermia is a quick warm up. If shelter and dry clothes are not available, improvise with what's there (below).

If you are close to shore you may be tempted to swim for it. DO NOT SWIM unless there is absolutely no chance of rescue and you are absolutely certain you can make it. If you do swim, use a PFD or some other flotation aid.

The answer to question #2 of our quiz was *false.* Alcoholic beverages should never be used to treat a hypothermic (suffering from extreme cold) victim. While a person may feel warmer after consuming alcohol, heat loss is actually increased. Alcohol is a relaxant and may relax constricted veins in the arms, legs and skin allowing cold blood to return to the core of the body. This causes a further reduction in body temperature called "after-drop" which can be fatal.

The symptoms of someone suffering from hypothermia usually occur in the following sequence: violent shivering, abnormal behavior, slowness of movement, slurring speech, stumbling, weakness, delirium and finally collapse.

First aid treatment for a hypothermia victim should include:

1. Move victim to a sheltered area. Do not let him walk.
2. Remove all wet clothing, handle victim gently.
3. Apply heat to the trunk of the victim's body (head, neck, shoulder, side, groin) by using a warm heated blanket, hot water bottles, towels soaked in warm water (rewarm them by adding warm water), a shower directed at the victim's trunk or a warm bath. If a bath is used, water should be about 110°F. Keep the victim's arms and legs out of the water to prevent "after-drop."

An effective field treatment is for one or more of the rescuers to remove their own clothes and get under a blanket or in a sleeping bag with a naked victim. If the victim appears dead, heart massage and mouth-to-mouth resuscitation should be administered.

In cases of mild hypothermia, shelter and dry clothing may be all that is needed. If the victim is conscious and can swallow without difficulty, he may be given a hot sugary drink.

The answer to question #3 in our quiz concerning the chance of recovery of two victims was Victim B, the cold water victim.

While cold water can be the cause of many water fatalities, it can also be an unappreciated life preserver.

Until recently the critical immersion time for a drowning victim has been considered four minutes. After that time brain damage and possible death is likely. However, recent studies by Dr. Martin Nemiroff at the University of

Michigan has detected the body's way of increasing its chances of survival through what scientists call the *mammalian diving reflex.*

Scientists have known of the diving reflex in marine mammals such as whales, seals or porpoises. These mammals, when threatened, have the ability to stay under water for extended periods of time (over 30 minutes) without brain or body damage. But it is only recently that we have found out that this survival reaction can apply to man.

The "diving response" in man is triggered by immersion of the face in cold (less than 70°F) water. Blood is diverted away from the arms, legs and skin to circulate (at a rate of only 6-8 beats per minute, in some cases) between the heart, brain and lungs. The reflex appears to be more active in younger victims. The temperature of the water also appears to be a factor. The colder the water, the more profound the response.

While the victim may show all the outward signs of death after being removed from the water: *no apparent pulse or heartbeat, cyanotic (blue) skin color, no detectable breathing, and pupils fully dilated (opened),* he may not be dead. The victim may survive if cardiopulmonary resuscitation (CPR) is begun at once.

In one documented case, an 18-year old male recovered after being trapped under ice and water for 38 minutes. When the boy was removed from the water all the symptoms of death were present, and he was pronounced dead at the scene. However, when a belch of air escaped from the body, an alert emergency medical technician began CPR and the victim was rushed to a hospital where treatment continued. The victim was brought back into consciousness and after a 14-day stay in the hospital returned completely recovered to college.

The administering of prompt CPR treatment is the key to survival for drowning victims. CPR instructors emphasize that mouth-to-mouth resuscitation should begin immediately, even while the victim is in the water if possible. If a person is revived or survived a "near" drowning incident, prompt medical followup is still required. Water that may have been absorbed by the lungs into the bloodstream may dilute the blood and cause a strain on the heart. In this case, death may follow 6-8 hours after the incident.

The purpose of this article is not to try to scare people out of participating in cold weather boating activities. But it is meant to inform people of the weather factor and the dangers present. Common sense dictates that being on the water in winter requires extra vigilance on everyone's part.

- Letters
- Comments
- This & That

BACK OF THE BOOK

ENVIRONMENTAL BRIEFS

Trout Stream Relocation

Bald Creek in Yancey County is about to be relocated. Since it is a trout stream, N.C. Department of Transportation engineers have been in consultation with Commission biologists to ensure that relocation will have minimum adverse impact on trout habitat. The relocation is being necessitated by widening US 19E from Burnsville to the Madison County Line. Commission biologists will assist with design of the new channel segments to provide pools, riffles and cover that are needed for feeding and resting areas for trout.

Mt. Mitchell National Park

A federally appointed study team is investigating the feasibility of establishing a National Park in the Mt. Mitchell area. The study area includes Mt. Mitchell State Park and adjoining National Forest lands currently designated as Game Lands. Also included is an expansive area of adjoining privately owned lands. Should this area be designated as a National Park, it is likely that it would be closed to hunting, thereby eliminating the favorite hunting area of many North Carolina sportsmen.

The Wildlife Commission has expressed opposition to the proposal, calling attention to the fact that the existing State Park and associated National Forest is already serving a broad range of recreational needs and that National Park designation would deprive many sportsmen of their traditional hunting territory. The Superintendent of the Blue Ridge Parkway has been designated responsibility for public involvement and persons wishing to comment on the proposal should send their comments to him.

Tagging of Bobcat Pelts Being Considered

Federal regulations currently under study may require that the pelts of bobcats taken during the 1977-

78 hunting and trapping season will have to carry a state-issued tag to make them eligible for the export market. The Wildlife Commission is investigating the development of a procedure that would make such tags available to fur dealers if the federal regulations materialize as presently proposed.

Fur dealer reports indicate that sale of bobcat pelts has increased substantially in the last few years in response to increasing market value. Bobcats are well distributed over North Carolina and present indications are that populations can withstand recent harvest levels. Should information develop that populations are being adversely affected by the increased take it may be necessary to restrict hunting and trapping seasons for this species.

Frank B. Barick

Transposed Columns

Apologies to all concerned in the Outdoors on TV item on pages 26 and 27 of the November issue. The last two columns of the news story on page 27 were transposed. Please put them back in the right place, making Larry Wallace special legal assistant to Secretary Lee, and Eva Clayton assistant secretary for Community Development.

Waterfowl Symposium

The Third International Waterfowl Symposium is scheduled for January 27, 28, 29, 1978, at Hyatt Regency, New Orleans, Louisiana. Cecil D. Andrus, 42nd Secretary of the Interior, is scheduled to deliver the Symposium's keynote address, setting the stage for other important speakers who will discuss husbandry of North America's waterfowl resources. Richard K. Yancey, Assistant Director, Louisiana Wildlife and Fisheries Commission, is the general chairman of the Symposium and will preside over a wide variety of topics.

A registration fee of $18 (this does not include meals or lodging) should be sent to Ducks Unlimited, Inc., PO Box 66330, Chicago, Illinois 60666. For hotel reservations call: 800-228-9000 and mention symposium.

KNOW YOUR ENFORCEMENT OFFICER

Jimmy M. Burns

Mr. Jimmy M. Burns was born February 26, 1943, in Robeson County. He is the son of Mr. and Mrs. Lonnie Burns of Rennert, N.C. After graduating from Red Springs High School in 1961, Jim worked in a textile mill in Red Springs until March 1963. He enlisted in the U.S. Coast Guard, completed Recruit Training in Cape May, N.J. and was assigned to Castle Hill Search & Rescue Station in Newport, R.I. Burns completed his four-year enlistment there and received a certificate for maritime law enforcement.

On April 10, 1967, while aboard the unmanned Brenton Reef light tower with one other Coast Guard employee checking commercial power, an electrical malfunction occurred. The other man received an electrical charge of some part of 2,000 volts and became transfused. Jim pulled him free by using an insulated stick. For this act, he was given the Coast Guard Commendation Medal and was selected 1967 Coast Guardsman of the Year in Newport, R.I. on June 16, 1967.

Jim attended Wildlife Recruit School at the Institute of Government at Chapel Hill in June, 1968. He was employed as a trainee January 1, 1969, stationed at New Bern and then was transferred to Hampstead as a Protector I. He has completed five In-service Training Schools, is a member of the Southeastern Association of Game & Fish Commissioners, Law Enforcement Section and the N.C. Association of Wildlife Law Enforcement Officers. Burns is a hunter safety instructor and BMI in the Coast Guard Reserve.

Jim is now living in Jacksonville as Area Leader; his patrol area consists of Onslow, Pender, New Hanover and a portion of Duplin counties.

He was married to Marilyn Burgess of Newport, R.I., on June 16, 1967. They have one daughter, Christine 8½ and one son David, 5. They attend St. Anne's Episcopal Church in Jacksonville.

ENFORCEMENT RECORD FOR SEPTEMBER 1977

HUNTING AND FISHING	
Persons Checked	30,997
Total Prosecutions	1,063
Total Convictions	949
Total Fines Collected	$ 3,451.50
Total Costs Collected	$23,352.00
BOATING	
Persons Checked	4,419
Total Prosecutions	914
Total Convictions	816
Total Fines Collected	$ 1,859.00
Total Costs Collected	$19,404.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

Winter Birds from page 11

By every appearance, the osprey is a hawk. The hooked beak, the profile of the head, the slotted primary feathers and the heavy talons leave no doubt. A single feature, the rotating outer toe, earns the osprey a place in a family separate from all other hawks, though some students of birdlife believe that a subfamily within the Accipitridae would be more appropriate.

The outer toe can be rotated, owllike, to the rear of the foot to help the osprey hold its slithery prey which consists almost entirely of fish. Thorny spicules on the pads of the feet aid in gripping. Once the talons are fastened into the fish, they are clenched securely by the geometry of the leg bones and tendons. Ospreys occasionally bind to fish so large that the prey drowns the "fish hawk." Fishermen's nets have yielded osprey skeletons still grappling with the fatal fish.

Usually the osprey prevails. The big bird hovers 30 feet or so above the water, aims, then folds its wings and dives headlong and feetfirst after the fish. No other bird enters the water with its head aimed at the target and its feet preceding the head. Rising to the surface with its prize, the fish hawk labors into the air with deep wing strokes and streamlines the fish into the wind, usually holding near the head with the left talon and gripping the body with the right. When safely airborne, the osprey shakes the water from its body as would a hound after crossing a stream. It flies to a feeding perch and, pinning the meal to a limb with its talons, tears off bite-sized chunks. The debris of gills, heads and fins beneath the favorite feeding tree of an osprey who visits a pond near Chapel Hill each spring draws an army of flies and scavengers.

The fish hawk has few natural enemies, though it is subject to the piracy of the bald eagle. Like the osprey, our national bird dines principally on fish. Where it shares a territory with an osprey, the eagle occasionally attacks the smaller raptor, forcing it to drop its catch. In a few quick wing strokes the eagle neatly catches the loot, and the osprey must fish again.

Ospreys have more to contend with than occasional skyjackings by lazy eagles. North American man has long amused himself by taking potshots at ospreys from excursion boats and more recently has so befouled the environment with poisons that the fish hawk's ability to reproduce has all but collapsed. Like the bald eagle, the osprey ingests chemical pesticides concentrated in the flesh of the fish it eats, with the result that mating and nesting behavior becomes indifferent, and eggs are laid with paper-thin shells within which embryonic osprey fail to develop. Populations have fallen drastically in the past few years. The loose nesting colonies along the coastal waters of our region have been decimated, and a pair of nesting ospreys is now a rare sight. Two eyries that I observed for several years on Chincoteague Island, Virginia have been unattended since 1973.

Hopes for the fish hawk rest on the ability of its prey to purge themselves of the now-outlawed DDT and other hydrocarbon pesticides, but poisons applied to the land a decade ago may only now be reaching the fish. Indicators show that the osprey continues to slip toward oblivion. Interested naturalists watching the farm ponds and tidal creeks of our region will be among the first to witness the osprey's recovery, if it occurs.

State Parks from page 18

Coast. A sizable brackish marsh dominated by big cordgrass occurs on the western edge. On the sheltered older dunes there are mature stands of pines, oaks, hickories, and aged hollies. In the northern portion of the site between the old dunes are numerous freshwater ponds harboring several rare aquatic plant species.

In 1975, 267 acres of Jockey's Ridge came under State ownership as a result of efforts by a local citizens' group to prevent development of the dune. It is being managed as a unit of the North Carolina State Parks System. Other tracts in the landmark site are owned by the townships of Nags Head and Kill Devil Hills as well as by various private interests.

Park facilities for Jockey's Ridge, as described in the master plan, are few but in keeping with the dune environment. Parking and picnicking will be limited to designated areas at the base of the dune.

For more information about North Carolina's Natural Landmark State Parks write: N.C. Department of Natural Resources and Community Development, Division of Parks and Recreation, P.O. Box 27687, Raleigh, N.C. 27611.

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Carolina Beach State Park	Marcia Constantino	September	20
William B. Umstead State Park	Marcia Constantino	October	22
Pettigrew State Park	Marcia Constantino	November	8
Natural Landmark State Parks	Marcia Constantino	December	16
PETS			
Of Pets and Things	H. Lea Lawrence	March	12
PHOTOGRAPHY			
Photography Contest		February	23
PLANTS			
Blackberry Winter	Robert L. Collins	May	18
RACCOON			
Mountain Raccoon Project	Tom Henson	April	22
RIVERS			
Saga Of The Undammed	Rip Collins	February	14
SQUIRREL			
Squirrels The Sly Way	Frank Mooney	October	8
TRAP SHOOTING			
Mobile Skeet	William G. Murray	March	23
TURKEYS			
Wayne Talks Turkey	Frank Mooney	April	6
Try For Caswell Turkeys	Durwin Elliott	April	20
Turkey Tension	Jack Smith	April	24
The Wild Turkey	Rosemary I. Waldorf	June	8
Spring Turkey Hunt Update	R. Wayne Bailey	September	6
TROUT			
Homemade Trout Fishing (1)	Willis King	October	13
Homemade Trout Fishing (2)	Willis King	November	17
WILDLIFE HABITAT			
The Case For Motorless Roads	Weakly & Wilfong	April	8
Wildlife Paradise	Cleve Cowles	May	14
Lake Mattamuskeet	Gary Stevenson	June	21
Attracting Wildlife	Emily Grey	November	20
WILDLIFE WEEK			
National Wildlife Week		March	27

PHOTO BY MIKE GODFREY

BLACK DUCKS

The general season on ducks opens on December 7 at noon, and runs through January 20 (the season on sea ducks opened October 10). The daily bag limit of five ducks may not include more than one black duck. For details on migratory bird regulations, write for your copy of the Federal Regulations Abstract. Wildlife Commission, 512 N. Salisbury St., Raleigh, NC 27611.

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